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Identification of Activities That Are Appropriate Parts of a Partnership Between Secondary Technology Education Programs and Business and Industry.

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IDENTIFICATION OF ACTIVITIES THAT ARE APPROPRIATE PARTS OF A PARTNERSHIP BETWEEN SECONDARY TECHNOLOGY EDUCATION PROGRAMS AND BUSINESS AND INDUSTRY

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ABSTRACT

The purpose of this study was to identify specific activities that are considered appropriate parts of a partnership between secondary technology education programs and the business and industry community by experts in the field of technology education and business and industry in the southeastern region of the United States. The states included in the study were Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

A form of the Delphi Technique was used to solicit and reach consensus on the appropriateness of partnership activities between secondary technology education programs and members of the business and industry community. The combined panel consisted of two secondary technology education teachers and two business and industry representatives from each of the nine states included in the study for a total of 38 panel members.

The study identified 153 unique activities during the first round of the study. These activities were categorized as relating to curriculum development and modification; supplies, materials, and equipment; instruction or staff development; and other activities. Following rounds two and three, the combined panel and the panel of secondary technology education teachers reached

consensus on the appropriateness of all 153 activities while the panel of business and industry representatives reached consensus on 152 of the activities.

CHAPTER 1

INTRODUCTION

Partnership is a term frequently found in the literature as it relates to educational endeavors. Stated simply, partnership implies working together; involvement in a collaborative effort. Swanson (1992), an Education Affairs professional with The British Petroleum Company, writes that business and education should take a "partnership, not sponsorship approach." He further states that this partnership should be balanced "between investing money, investing time, and communicating effectively" and that working with education should be a "normal part of doing business." He further noted that partnerships are a "working relationship based on interdependence and mutual benefit." Partnerships, according to Swanson, differ from the more traditional sponsorships in that they are less dependent upon money, are proactive rather than reactive, and are more diffuse and open-ended relationships in which ideas are exchanged and mutual respect developed.

Effective partnerships are important not only to education, but also to business and industry. In many instances, business and industry have supported education simply by becoming a member of Adopt-A-School programs. Most of these programs are promoted as ways that local

businesses can assist the adopted school. Little mention is made of the ways that schools can benefit businesses. Johnson (1992) states that

> Business and industry must become much more involved in this work, recognizing the importance of technology, as well as science and math, to the future of local, national, and global commerce in the modern technological world. No sector of society has a greater stake in a successful outcome for this effort! (p. 5)

Schools should provide easily recognizable benefits to the local business community. Through effective partnerships, business and industry can encourage and influence the educational system to be a provider of substantial and necessary assets, such as a well-prepared, literate workforce. In order to be of maximum benefit, partnerships must serve both the education community and the business interests. As Johnson makes clear, industry has much to gain from a successful educational system.

Vocational Education is charged by its congressional mandate with the responsibility of preparing students to enter or reenter the workforce or to retrain those who are already a part of the workforce. As a component of vocational education, technology education programs have the responsibility of providing students with concepts

pertaining to industry and an understanding of materials and processes found in industry, without the responsibility of specific job training that is attached to other vocational education programs. Collaboration between members of the technology education community and business and industry is a natural and necessary component in this endeavor. Starkweather (1986) underscored the mutually beneficial relationship of industry and technology education in his definition of technology education:

> Technology Education- The comprehensive curriculum area which has an action based instructional program concerned with technology, its evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and product; and will combine the social and cultural impacts. (p. 5)

If technology education is to teach students about industry, including its organizational structure, its personnel attributes, its techniques of accomplishing goals, as well as about the resources and products that it uses and produces, technology education must be involved with industry. Likewise, if industry is to be assured of a technologically literate workforce, industry must be involved in a partnership with technology education.

As previously presented, business and industry and technology education must work together in a partnership designed to benefit each entity involved. Evidence of partnerships between business and industry and educational programs exists. An issue of the America 2000 newsletter from the U.S. Department of Education (1993) cites several examples of partnership programs. One such program includes the efforts of Pacific Theaters of Los Angeles to improve public school libraries and encourage reading. Another article in the report described the America 2000 Coalition, a group of 84 businesses and other organizations who are working with local communities to assist in the achievement of the six National Education Goals. Other articles and publications exist that tout the efforts of business and industry and general education to work together for the improvement of the educational system.

Although partnership activities are apparent between education and business and industry, partnerships between technology education and business and industry appear less frequently. When cooperation between technology education and business and industry does exist, it is often a limited exchange of equipment rather than a true partnership. These cooperative efforts are generally not publicized other than through a promotional article in the

local newspaper or company newsletter. This lack of promotion leaves others in the industrial and technology education communities uninformed as to the scope of activities that may be a part of a collaborative relationship. Therefore, the question arises,"what can business and industry, in conjunction with secondary technology education programs do to encourage partnerships where they don't exist and to strengthen them where they do exist?"

Statement of the Problem

The literature sufficiently supports the need for technology education and business and industry partnerships and the mutual benefits that may be derived from these partnerships. There remains, however, a need for a concise, clear enumeration of activities that constitute desirable components of a partnership between technology education programs and business and industry. The literature further suggests that when partnerships do develop between technology education and business and industry, they often develop along a single focus, tend to be somewhat one-sided, and are not publicized for others to study and improve. In short, there is little information available to characterize a balanced, successful partnership. Identifying the essential elements of successful partnerships could prove to be of

significant value to those desiring to develop successful, balanced partnerships.

The literature supports the idea that some technology educators participate in collaborative efforts with members of the business and industry community. Unfortunately, most of these efforts are done privately, with few or no attempts to make others in the field aware of the cooperative activities that are possible or even desirable. The scope of these activities is also limited, consisting primarily of the donation of equipment and materials no longer of use to the business contributing to technology education programs . Furthermore, most of these collaborative efforts appear to be one sided, with business and industry seeking to gain little more than some local publicity or a tax write-off.

Although the literature addresses the need for partnerships between members of the business and industry community and technology education programs, there is an absence of a well-developed knowledge of activities that may be incorporated into a partnership between technology education programs and members of the business and industry community. This study attempted to identify activities that may be of significant value as components of partnerships between technology education programs and business and industry.

Significance of the Study

Technology is in a state of constant change. Industry encourages, creates, and reflects this change. Technology education programs are often ill equipped to reflect these changes. Merriam and Cafferella (1991) point out that the amount of information in the world doubles every seven years. In addition, they note that approximately one-half of the skills and knowledge that a professional learns while involved in professional training programs will be outdated within five years. A recent study by Dugger, French, Peckham, and Starkweather (1992) reports that the vast majority (85.8%) of the technology educators who are currently teaching in the United States have been teaching for ten or more years. This suggests that, barring additional education, most of these educators graduated from teacher education programs over a decade ago.

Technological changes have occurred in dramatic proportions since currently practicing teachers received their formal, technical preparation for teaching technology education. Partnerships with business and industry can bring new information into the classroom. Hopefully, the activities identified by this study will provide ideas as well as the motivation for technology educators to become more up to date on emerging

technologies and processes used in modern and future industry.

At the same time technology is undergoing rapid change, funding for educational institutions, including secondary technology education programs, is being held steady or in many cases is decreasing, especially funding earmarked for innovation and improvement of existing programs. Funds to local education agencies were further reduced when the reauthorized Perkins Act that went into effect on July 1, 1991, removed Title II-B funding that was set aside for the improvement and innovation of existing programs. Thus, it became the intent of the federal government that the maintenance and upgrading of existing programs be the responsibility of the state and local school systems. Unfortunately, with state funding for vocational programs being virtually eliminated in many states and considering that many local school systems are financially drained, funding is often insufficient, if not entirely absent. The results of this study will provide information that should benefit technology education programs that are limited by insufficient state and local funds for the maintenance of their existing programs.

This study may also benefit members of the business and industry community by providing ideas for developing more effective partnerships with secondary technology

education programs. These partnerships may provide graduates that are more technologically literate and therefore better prepared to become productive members of the workforce. In its list of 16 essential skills for entering the workforce, the American Society for Training and Development (1991) included a number of skills that could be enhanced through technology education/business and industry partnerships, such as employability and career development, teamwork, and problem solving. An effective partnership could provide opportunities for the enhancement of these skills.

Purpose and Objectives

The purpose of this study was to identify specific activities that were considered appropriate parts of a partnership between secondary technology education programs and the business and industry community by experts in the field of technology education and business and industry in the southeastern region of the United States. The study was intended to accomplish the following specific objectives:

1. To identify specific activities that were considered important parts of a collaborative partnership between secondary technology programs and members of the business and industry community as identified by the combined panel of technology educators and

business and industry representatives from the southeastern region of the United States who have been active participants in education/business and industry partnerships.

2. To identify specific activities that were considered important parts of a collaborative partnership between secondary technology education programs and members of the business and industry community as identified by a panel of technology educators from the southeastern region of the United States who have been active participants in education/business and industry partnerships.
3. To identify specific activities that were considered important parts of a collaborative partnership between secondary technology programs and the business and industry community as identified by a panel of business and industry representatives from the southeastern region of the United States who have been active participants in education/business and industry partnerships.

Glossary of Terms

For the purpose of this study, the following definitions of terms were used:

Business and Industry - Members of the commercial community responsible for the manufacture, distribution, purchase or sale of commodities, materials, equipment, or services.

Collaboration - Working together to accomplish a goal or set of goals designed to benefit any or all of the parties involved.

Partnership - A collaborative effort between a school(s) or school district(s) and one or more community organizations with the purpose of improving the academic and personal growth of America's youth. (taken from "Meeting the Challenge: Using Partnerships as Catalysts for Change" by the National Association of Partners in Education, Inc.)

Southeastern United States- The region of the United States that includes the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee

Technology Education - The comprehensive curriculum area which has an action-based instructional program concerned with technology, its evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and product; and their combined social and cultural impacts. (Starkweather, 1986). Emphasis is upon the development of concepts and

understandings of materials and processes, not on specific job training.

Vocational Education - This group of academic programs is designed to prepare students for entry into the workforce, retrain workers already in the workforce, and provide opportunities for the development of interests related to occupational endeavors. Program areas include Agriscience, Business Education, Health Occupations, Home Economics, Marketing Education, Technology Education, and Trade and Industry.

CHAPTER 2

REVIEW OF LITERATURE

The literature suggests that activities related to education and business and industry partnerships can be arranged into four areas:

a. the importance of business and industry partnerships to educational programs;
b. examples of partnerships found between business and industry and educational programs;
c. the importance of business and industry partnerships to technology education programs;
d. examples of partnerships between business and industry and technology education programs.

The information in this chapter will be grouped around these four areas.

The Importance of Business and Industry Partnerships with Educational Programs

Partnerships differ from the traditional sponsorships in that they provide benefits to both the educational program and the businesses involved. Swanson (1992) wrote

> Partnership is not a one-way process, where education is simply providing industry with school-leavers, or business is simply donating money to worthy educational causes, it is a working relationship based on interdependence and mutual benefit. Both

> sides have much to offer each other if only they take the time to talk, discuss and share. (p. 136)

Swanson also stated that "If we, as business and education, work in partnership to define the needs, identify solutions and deliver programmes, we will be more cost-effective and will maximise the benefits" (p. 136).

In the same report, Swanson went on to discuss why industry should become involved with education. According to Swanson, industry involvement with education "is in its own long term interest" (p. 137). He refers to industry's need for a "healthy and thriving economy" in order to operate effectively, efficiently, and profitably (p. 137). He also reflected on the fact that industry needs better-informed citizens in order to get its "licence to operate". This license requires an "acceptance of our business." He reported that "business's local reputation is critically dependent on the role we play in our local communities. If we get this wrong, it can seriously affect our ability to do business" (p. 137). As a significant benefit of a partnership, Swanson also cites the "exchange of services." Relating to the exchange of services, he points out that "both education and business benefit from exchanging people, information, expertise, and facilities (p. 137).

Tibbitts (1991), in a report on a study conducted by the Massachusetts State Council on Vocational Education, cited the need for a greater impact of the private sector on vocational education. Concerning the need for greater impact, 46% said that the overall impact of the private sector on vocational education is not sufficient, compared to 29% who said that they were satisfied with the impact of the private sector and 25% who are not sure. According to the report, "Many of the earlier responses on the survey suggested that private-sector members were prepared to become more involved, given the opportunity (p. 19). One of the respondents participating in the study stated that "Voc-tech institutions should solicit 'real world' professionals for one-shot lectures or one-day seminars. Students should somehow be exposed to the 'real world' on a regular basis" (p. 20).

A study by Miller, Edmunds, and Mahler (1991) addressed the issue of developing higher education partnerships with business and industry. According to the report of this Delphi study, respondents reached consensus on several statements relating to business and industry collaboration with vocational education including "emphasize the necessity of collaboration between all elements of the education system" and "work to increase the support of vocational education by private business

and industry." (p. 8). Respondents also reached agreement on "encourage a more flexible vocational curriculum that better meets labor force needs." (p. 8). In its conclusions, the need for the "development of programs in secondary education, including personnel development (both pre-service and in-service offerings), curriculum development, secondary program assistance in evaluation and assessment, and business and industry linkages" (p. 9) was expressed.

According to an article in Vocational Education Weekly, The National Assessment of Vocational Education (NAVE), in a report to Congress on June 30, 1994, recommended that revisions for the upcoming reauthorization of the Perkins Act include an expansion of its reform agenda to restructuring education for non-college-bound students in order to prepare them effectively for work (p. 1). Among NAVE's recommendations regarding this restructuring were the development of occupational clusters which would prepare students for careers rather than jobs; emphasize the development of conceptual skills, broad technical skills, and understanding of industries at the secondary level; and use work experience, including jobs students find for themselves, to increase understanding of issues such as how the labor market functions and the skills and personal

qualities required by the workplace (p. 2). In the same report, NAVE recommended that the new Perkins Act should support business-labor-education partnerships for training, which are currently authorized, but not funded (p. 3).

Examples of Partnerships Between Business and Industry and Educational Programs

Tibbitts (1991), in a project sponsored by the Massachusetts State Council on Vocational Education, reported selective comments written by advisory council members during the study. The comments were a response to the question, "How to improve private sector impact on vocational education." Among these comments was the statement, "Each company should have a plan for school-business participation" (p. 20). In addition, another member wrote

> Participation by more employers in the process of educating students! I participate because I believe in this type of education and I feel that as a practitioner in the field I can give first-hand knowledge about materials, equipment, and techniques being used in the workplace now (p. 20).

The literature reveals examples of how business and industry participates in the process of educating students

through partnerships between business and industry and educational programs.

Former President Bush and the nation's governors, with the support of major business leaders through the America 2000 initiative, emphasized the role that business and industry should play in the development and execution of educational goals and curricula. The America 2000 initiative invited communities across the United States to support and encourage the achievement of six national educational goals. These goals included:

By the year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

4. U.S. students will be first in the world in science and mathematics achievement.
5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

An important part of this strategy was the development of over 525 "New American Schools." These schools were intended to be the best schools in the community and were to be committed to the six national education goals. In the booklet, America 2000, An Education Strategy (1991), Bush stated, "There's a special place in inventing the New American School for the corporate community, for business and labor. And I invite you to work with us not simply to transform our schools, but to transform every American adult into a student" (p.55). In the same report, Bush emphasized the importance of industry involvement in lifelong learning as he remarked:

> The corporate community can take the lead by creating a voluntary private system of World Class Standards for the workplace. Employers should set up skill centers where workers can seek advice and learn new

> skills. But most importantly, every company and every labor union must bring the worker into the classroom and bring the classroom into the workplace. (p. 55)

In the same vein, the report stated that "Every major American business will be involved in strengthening the connection between education and work" (p. 39).

The weekly newsletter, America 2000, for the week of January 11, 1993, (incorrectly dated as the week of January 11, 1992) cited several examples of business and industry and education partnerships. One of these partnerships was the Corporate/Community School, Chicago, Illinois. According to information in the newsletter, the Corporate/Community school is "funded by the local business community, which features an 11-month school year, an extended day, and a non-graded learning environment" (p. 3).

Another business and industry and education partnership that was described in the newsletter involves a partnership between the Richland High School, Richland, Washington, and Battelle Pacific Northwest laboratories. It "provides mentoring for students and practical, hands-on experience for teachers" relating to the combining of "the study of chemistry, physics, engineering, mathematics and crafts" (p. 4).

A third partnership effort involved Pacific Theaters of Los Angeles and Huntington Park Elementary School. The focus of this partnership was "working to improve public school libraries and encourage student reading" (p. 4). In this partnership, Pacific Theaters assisted the school in expanding and renovating its library.

President Clinton continued presidential support of the America 2000 initiative upon taking office, through his own program "Goals 2000: Educate America." In the inaugural issue (April 1993) of Community Update, the newsletter of the Goals 2000: Educate America initiative, Dick Riley, Clinton's Secretary of Education, stated that:

> Another lesson I learned in South Carolina is that school reform depends on both "insiders" and "outsiders," working hand in hand. Teachers and principals, parents and politicians, school boards and administrators, business and labor, and state and federal leaders all have vital roles to play. (p. 2)

A compendium released by the Connecticut State Board of Education (1985) described the "award winning programs" selected as a part of its Vocational Improvement Practices or VIP Program. One of the programs described in the VIP compendium was the Bloomfield School/Business Collaborative. The major objectives of this collaborative were given as:

> To expand the participation of local business and industry in school programs; to review the curriculum and assess the equipment presently in place in the business department; to acquire assistance in future purchases of equipment; to provide supportive services for teachers; to provide students with necessary skills for job entry. (1985, p. 6)

According to the report, the collaborative was instrumental in the acquisition of updated equipment and textbooks, professional days for teachers, and field trips for students. In addition, resource people were identified to assist in the purchase of equipment and the modification of the curriculum.

Porter (1993) describes a program in California, officially known as Project A.L.I.V.E., that has been in existence since the 1990-91 school year. According to Porter, "The acronym stands for 'academic learning integrating vocational education,' but the project is more commonly known in Pasadena as 'partnership academies'" (p. 33). The article describes the program as consisting of five partnership academies focusing on computer careers, finance, space, graphic arts, and visual arts/design. These academies are reported to be funded through the contributions of numerous members of business and industry at local and national levels. These "partnership

academies" are designed to benefit not only the student, but the business community as well. Porter reveals this fact by stating:

> First I went out into the business community and talked with each potential partner. I told them our goal was to create world-class high school graduates who would be able to contribute significantly to the workforce with or without college. The businesses were sold on that concept first before they ever were asked to donate equipment, supplies, or other funding. (p. 34)

The author further states that:

> After seeing only a single flow chart showing the competencies students would be expected to master, the business and industry executives were ready to come aboard. They helped develop a curriculum for each academy and then completely furnished the classrooms: from carpet to furniture to modern equipment. (Porter, 1991, p. 34)

The Importance of Business and Industry Partnerships with Technology Education Programs

The literature is replete with references related to the relationship that technology education, industrial arts education, and industrial education may have with the business and industry community. For a number of years,

it has been recognized that technology education, or in its earlier form, industrial arts, needed to interact with entities outside the classroom setting. Most of the references found in the literature only address the benefits that the technology education program or its students can receive as a result of the relationship.

Hickman (1986) underscores the importance of the involvement of private business and industry with industrial education programs. He wrote:

> If the private sector is consulted, it stands to reason that our programs will likely become more up-to-date in technological advancements and prove highly beneficial for our students. Ultimately, this additional influence upon our curriculum should decrease skepticism among critics because industrial professionals can guide and direct us in our endeavors. (p. 41)

In addition, he stressed that, "If our intent is to truly teach our students about industry and business, then what better resource can we acquire than the private sector" (Hickman, 1986, p. 41).

Martin (1975) stated that "Industrial arts, with the current pressures upon it, can no longer relate to its subject areas and its students in isolation from the community. Students must interact with community

resources" (pg 73). Martin quoted Foshay (1970) to underscore his point as follows:

> The time is almost at an end when we can treat the school as a special institution, with its special little world that students enter each day and leave in mid-afternoon. For the school to be humane, all that it means to be human must be a part of the school, and that means that the reality of the world must be a part of the reality of the school. (p.45)

Vescera and Dimeo not only believe that technology education and business and industry linkages are important, but they place it at the beginning of the curricular planning process. Vescera and Dimeo (1982) state that, "Establishing a school-community linkage by outreach/internship/shadowing placements can be a first step to providing good programs" (p. 14).

An important fact of life for most modern technology education programs is the need for increased or supplementary funding at a time when many school systems are financially strained. Thielke' (1993) reflects this need for monetary support, as well as the need for industry support, as he writes, "As budget cuts affect program needs, clubs and programs across the curriculum need to rely more and more on themselves and business in continuing to offer well rounded programs" (p. 39).

The literature also reflects the belief that business and industry will also receive benefits from a cooperative relationship with technology education programs. One of these benefits centers around the amount of "re-education" of employees conducted by business and industry. Moorhead (1992) writes:

> Business and industry spend more time and money on re-educating employees than the school systems do on educating students. Obviously, this situation should not exist. The education field must work with local business/industry people to identify those weak areas that need re-education. Technology Education can be the catalyst for this endeavor. (p.3)

He states that, "Technology Education relates academic subjects to the real world" (Moorhead, 1992, p. 3). Through a relationship with "real-world" activities, technology education students may be better prepared to become an integral part of the business and industry community.

Examples of Partnership Activities Between Business and Industry and Technology Education Programs

The literature revealed that there are partnerships in existence that involve business and industry and technology education. These partnerships exhibit differing degrees of involvement and focus on a range of

activities. Hickman (1986) offered five common ways to involve industry in industrial education programs: field trips, job shadows, guest speakers, advisory boards, and direct professional involvement in the classroom instruction (p. 28).

The Connecticut Vocational Improvement Practices compendium (1985) described the Adopt-A-School (Computer-Assisted Drafting) program. This partnership involved industrial arts drafting students at Bassick High School in Bridgeport, Connecticut and the Bodine Corporation. The report described the program as giving the students the opportunity to gain "experience in the versatility of computer-assisted drafting (CAD) equipment; to give students the opportunity to develop CAD skills" (p. 4). This was accomplished largely through the placing of Bassick High School students on CAD equipment at the Bodine facilities, under the direct supervision of Bodine engineers after school hours. According to the report, all costs were absorbed by the Bodine Corporation.

Martin (1975) wrote about an effort to "close the communications gap between industry and industrial arts" (p.73). He stated

> As a minimum, teachers and students would be constantly receiving updated industrial and technological data from the industrial community. In

> some instances, school systems might receive tools and machines from local industries. Field trips, guest speakers, audiovisual aids, and technical assistance could be made available to the teacher and the student. (Martin, 1975, p. 74)

In the same article, Martin also listed ways in which industry could assist the industrial arts teacher. These responses were the result of asking teachers and prospective teachers, "Of all the different types of assistance that you could receive from the industrial community, what type(s) would be most valuable to you?" (p. 75). Common responses were given as follows:

Industry could assist the teacher in:

* planning the layout of the industrial arts laboratory so that it more closely reflects the industry and technology laboratory layout;
* loaning tools, materials, and equipment on a short term basis; giving gifts; or even purchasing equipment for the teacher;
* providing new project ideas that more closely reflect techniques and methods of manufacturing industrial products;
* providing free, on-loan, various audiovisual needs of the teachers;

* providing a buyer's guide to purchasing tools, material, and equipment that would help the teacher in purchasing within the constraints of his budget;
* developing programs as well as products that are "action" oriented;
* providing manufacturing displays that show the latest products, manufacturing methods, etc. that would act as a supplement to classroom instruction;
* developing one-day or half-day workshops for teachers that cover the latest in industrial and technological developments;
* supplying free-of-charge surplus materials available in the company's inventory; and
* developing a directory that would be available to all teachers and which might contain a complete listing of possible field trips, guest speakers, audiovisual aids, etc. (p. 75)

Nee (1972) wrote about the importance of "a cooperative school and industry safety workshop" (p. 62). He stated that, "A cooperative school and industry safety workshop can help expand this objective to include the development of knowledge and behavior necessary from a safety point of view in the post-educational setting of actual employment"

(Nee, 1972, p. 62). Nee (1972) went on to further describe a ten-week safety education workshop conducted at the Saint Paul Technical and Vocational Institute by members of the business and industry community industrial education professionals.

Thielke (1993) mentions a number of activities in which local companies participated with the Howards Grove High School Technology Education Program. Among the activities cited were the donation of materials (plastics, engines, CAD systems, etc.), the loaning of equipment, and technical and career consultation (p. 39).

McPherson (1975) discussed a program conducted at the State University College of Oswego that is similar to activities mentioned by other citations in the literature. The program at Oswego, known as the Directed Field Study in Industry Program, was designed to place future industrial arts teachers into actual industrial settings. According to McPherson (1975) this program attempted to provide the future industrial arts teachers with a broad understanding of industry, including its functions, history, principles, relationships with labor, economies, and other important concepts that could be brought into the high school classroom (p.12).

Summary

In summary, the literature reveals numerous examples of partnerships between education and business and industry. It also suggests that partnerships are important both to the educational programs and to the businesses and industries that are involved. The reasons given include financial considerations, academic effectiveness, acceptance of businesses by the community, and the need for a literate workforce.

Partnerships between business and industry and technology education programs were found to exist, but less frequently than education in general. Several references were found that expressed the importance of partnerships between business and industry and technology education programs.

CHAPTER 3

PROCEDURE AND METHODOLOGY

The purpose of this study was to identify specific activities that may be considered appropriate parts of a partnership between secondary technology education programs and the business and industry community. In addition, the study sought to determine the level of agreement as to the appropriateness of the activities ranging from strongly disagree to strongly agree. For this study, a form of the Delphi technique was selected in order to most effectively and efficiently achieve these goals.

Population

The target population of this study consisted of those persons involved in technology education programs and business and industry in the Southeastern region of the United States. For the purpose of this study, the Southeastern region of the United States was defined as the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee. These states were selected based on similarities relating to demographics, reliance on agriculture and related agricultural industries, climate, and geographical location.

Makeup of the Panel

The participants selected for the Delphi panel consisted of two groups of persons, based upon their positions in the fields of technology education or business and industry. The two groups that made up the panel included secondary technology education teachers from the southeastern region of the United States and representatives of business and industry in the southeastern region of the United States.

Selection of Panel Members

In order to select panel members who could significantly contribute a high level of expertise to the study, carefully considered procedures for their selection were devised and implemented. The selection process for both groups of panelists was implemented at the same time in order to have each of the panels in place in a timely manner. These procedures are described below.

Secondary technology education teachers- A letter (see Appendix A), along with a nomination form (see Appendix B) was sent to the Supervisor of Technology Education or their equivalent at the State Department of Education in each state located in the southeastern region of the United States. These supervisors or a designee were asked to nominate two secondary technology education teachers from their state, along with three alternates, to serve on

the panel. The letter requesting the nominations described the criteria to be used in the selection of the secondary teachers. Among the criteria given were that the teachers be involved in successful technology education programs and that they must have experience in working with business and industry partnerships. The letter further requested that the supervisors provide the technology education teachers' school and home addresses and phone numbers. By the requested date of return, five of the nine state supervisors had returned the completed nomination forms. Telephone follow ups, along with a follow up letter (see Appendix C) yielded three additional completed nomination forms. The state supervisor who did not respond to the original request or subsequent follow up expressed reservations in regards to being able to make valid nominations and was replaced, by mutual consent, by a faculty member within the School of Technology at a university in the same state to make the nominations. The designee was contacted by telephone and nominations were obtained.

Once the nominations were obtained, a letter explaining the study (see Appendix D) was sent to each of the nominated teachers asking for their participation on the panel. A form (see Appendix E, along with a stamped, self-addressed envelope, was included in the mailing for

them to return to the researcher to signify their acceptance or refusal, as well as to make address or other changes. In addition, space was provided on the form for the nominees to briefly describe their past participation in education/business and industry activities, in order to verify past involvement in some type of education/business and industry partnership, either formal or informal. Non-respondents were sent a follow-up letter (see Appendix F) approximately two weeks later and were contacted by telephone to determine their willingness to participate in the study. As the intent forms were received, they were reviewed by the researcher for expressed willingness to participate in the study and for previous experience in business and industry/education partnerships. Nominees without previous experience in education/business and industry activities or who expressed an unwillingness to serve on the panel were disqualified, and an alternate from the same state was selected and contacted using the procedure described for the initial nominees. Of the eighteen nominees, nine were selected to serve on the panel representing their state based on their meeting the basic criteria for inclusion and their willingness to serve. None of the nominees were disqualified for a lack of previous experience, but instead declined to participate. Those electing not to participate were

nominated from the states of Arkansas (2), Florida (2), Mississippi (1), North Carolina (2), and South Carolina (2). The additional nine panel members were selected from the alternates for their respective states using the same procedure that was used for the nominees. The selection process for the panel of technology teachers was completed in approximately 65 days.

Business and industry participants- In order to identify and select business and industry participants, the researcher contacted the National Association for Partnerships in Education (NAPE), which is based in Alexandria, Virginia. NAPE was considered after being recommended by a member of the Baton Rouge Chamber of Commerce and the local NAPE representative in Louisiana. Investigation into the philosophy and organizational integrity of NAPE, along with the availability of NAPE representatives in each of the states selected for this study, confirmed the suitability of NAPE as a means of securing the business and industry nominations. NAPE's Public Relations Officer provided the names of contact persons representing each of the nine states that make up the Southeastern Region. These contact persons held the following positions:

Alabama- NAPE Regional Vice President

Arkansas- NAPE Board Member

Florida- NAPE Regional Vice President

Georgia- President of Georgia Association of Partners of Education

Louisiana- President of the Louisiana Association of Partners of Education

Mississippi- NAPE Regional Vice President

North Carolina- President of the North Carolina Association of Partners of Education

South Carolina- President of the South Carolina Association of Partners of Education

Tennessee- President of the Tennessee Association of Partners of Education

The contact persons representing each state were sent a letter (see Appendix G), along with a nomination form (see Appendix H), asking them to submit the names, addresses, and phone numbers of two members of the business and industry community, along with three alternates, in the respective state, who have been active in partnerships with education for inclusion on the Delphi panel. By the date given in the letter for returning the nomination forms, one nomination form had been received. A follow up letter sent approximately two weeks later (see Appendix I), along with a follow up phone call yielded three additional completed forms. Two of the representatives referred the researcher to another person

whom they felt was better qualified to make the nominations. A copy of the letter and nomination form sent to the original representatives was sent to these two persons. Additional follow up telephone calls resulted in the return of completed nomination forms from each of the additional respective business and industry personnel for each state.

Once the nominations were obtained, a letter explaining the study (see Appendix J) was sent to each of the nominated individuals, which asked them to participate in the study. An intent form (see Appendix K) and a stamped, self addressed envelope was included in the mailing for them to return to the researcher to signify their acceptance or refusal, as well as to make address or other changes. In addition, the intent form asked the nominees to briefly describe their past participation in education/business and industry activities, in order to verify past involvement in some type of education/business and industry partnership, either formal or informal. Non-respondents were sent a follow up letter (see Appendix L) and were contacted by telephone. As the intent forms were received, they were reviewed by the researcher for willingness to participate and for previous experience with involvement in business and industry/education partnerships. Nominees without previous experience in

education\business and industry activities were disqualified, and an alternate from that state was selected and contacted using the procedure described for the initial nominees. Of the 18 nominees, 10 were selected to serve on the panel representing their state based on their meeting the basic criteria for inclusion and their willingness to serve. None of the nominees were disqualified for a lack of previous experience, but instead declined to participate. Those declining to participate were nominated from the states of Alabama (1), Florida (2), Louisiana (1), Mississippi (1), North Carolina (1), South Carolina (1), and Tennessee (1). The additional eight panel members were selected from the alternates for their respective state using the same procedure that was used for the nominees. The selection process for the panel of business and industry representatives was completed in approximately 134 days.

Instrumentation

This Delphi study consisted of three rounds. The first round of the study consisted of a letter of explanation (see Appendix M), a glossary of terms relating to the study (see Appendix N) and a questionnaire (see Appendix O). The questionnaire included four open-ended questions designed to elicit responses that would provide a listing of activities that the respondent felt were

appropriate to a partnership between education and business and industry. The four questions were based upon, "What activities are appropriate for inclusion in a partnership between secondary technology education programs and business and industry?" and were related to the following areas: curriculum development and modification; supplies, materials, and equipment; instruction or staff development; and other areas not previously mentioned. The questionnaire was validated using a panel of experts. This validation panel consisted of three secondary technology education teachers and three business and industry representatives who were not included in the actual panel of respondents. Based on the recommendations of one or more panel members, slight revisions were made to the questionnaire, including adding "staff development" to question three and instructions for indicating "No activities are appropriate" if they were inclined.

The second round of the study included a letter of information (see Appendix P), along with a questionnaire (see Appendix Q), that contained the items that were identified as appropriate parts of a partnership between education and business and industry by panel members during the first round. Activities were grouped with others that were of similar nature, based on the four

categories used in the initial questionnaire. Responses that were deemed to be of identical intent were combined into one item. Items that were of a similar nature but that contained one or more limiting conditions were not combined with other items in order to protect the intent of the item. Panel members were informed of this process and were encouraged to resubmit activities that they felt were inappropriately combined or restated. One hundred, fifty-three items were listed on this questionnaire. Each respondent was given the opportunity to express their level of agreement as to the appropriateness of each of the activities listed for inclusion in a partnership between secondary technology education programs and business and industry. The levels of agreement were rated using a five point Likert-type scale as described below:

RATING	DESCRIPTOR
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

In addition, panel members were given the opportunity to add responses to the questionnaire for inclusion on the third questionnaire. A follow-up post card (see Appendix R) was sent to each panel member approximately four days after the questionnaire was mailed.

The third round consisted of a letter of information (see Appendix S) and a questionnaire that contained all of the 153 items from round two (see Appendix T). No new items were added to or deleted from the questionnaire by the respondents in the second round. In this round, the participant's score from round two was indicated and the combined panel's mean score for each item was given. Each participant was asked to reconsider each item by either rescoring the item or keeping their previous rating. This gave each member the opportunity to compare their score to the mean of the combined panel and either reconsider their score or keep their previous rating. This was done in order to facilitate the consensus building process. Consensus was considered to have been reached on the appropriateness of an item when 51% of the respondents rated the item within plus or minus one point of the median on the five point Likert-type scale of agreement. Round three also allowed panel members to add new items to the questionnaire to be reported in the findings of the study. A follow-up post card (see Appendix U) was sent to

each panel member approximately four days after the questionnaire was mailed.

Analysis of the Data

In order to achieve the objectives of this study and given the fact that the data that was to be collected was classified as ordinal data, median scores were used to determine the appropriateness of each of the activities, as rated in the final round of the study. As previously defined in the instrumentation section of this report, mean scores were calculated and presented to the respondents in the third round for consideration during that round.

CHAPTER 4

FINDINGS OF THE STUDY

The purpose of this study was to identify specific activities that were considered appropriate parts of a partnership between secondary technology education programs and the business and industry community. In addition, the study sought to determine the level of agreement with the appropriateness of the identified activities as rated by a panel of experts representing secondary technology education teachers, representatives of the business and industry community, and the combined panel. In order to fulfill the purpose and achieve the goals of this study, a form of the Delphi technique was used as a means to gather the necessary data.

Results of Round One

Through the use of open ended questions on the initial questionnaire, 153 unique activities were identified by the combined panel. These activities were derived by merging identical items in order to eliminate duplications, according to procedures described by Delbecq, Van de Ven, and Gustafson (1975). Some items that were similar in nature but that contained limiting conditions were not combined so that the intent of the item was not compromised. Fifteen of the 18 technology education teachers returned the initial questionnaire for

a return rate of 83.3%. Seventeen of the 18 business and industry representatives returned the initial questionnaire for a return rate of 94.4%. The return rate for the combined panel was 88.8%. The 153 items identified in the first round of the study may be found in Tables 1, 2, 3, and 4. The items have been grouped according to the areas used for the questions on the initial questionnaire: curriculum development and modification; supplies, materials, and equipment; instruction or staff development; and other activities.

Table 1

Partnership Activities Identified by the Combined Panel in Round One Related to Curriculum Development and Modification

No.	Activity
1.	Business and industry can be allowed and encouraged to provide input into the development of curriculum.
2.	Business and industry can provide general and specific training materials to be included in the curriculum.
3.	Business and industry can provide input into general and specific behavioral objectives for their future employees.
4.	Business and industry can serve on advisory committees to help choose instructional materials as used in business.
5.	Business and industry personnel can tour school facilities in order to offer suggestions on curriculum changes.

(table continues)

No.	Activity
6.	Business and industry can provide technology educators with information on the latest developments in supplies, materials, and equipment.
7.	Business and industry can make suggestions regarding supplies, materials, and equipment used in the technology education program.
8.	Business and industry can create curricula for the equipment used in the classroom with the input of the classroom teachers.
9.	Business and industry and technology education programs can develop standards to ensure that partnerships are working and don't exist in name only.
10.	Business and industry personnel can review texts and suggest methods of applications of theory to the real world/work.
11.	Business and industry can participate on school board curriculum committees.
12.	Business and industry representatives can make presentations to schools, community school boards, educators, etc., on the value, need, and benefits of changing curricula and teaching methods.
13.	Technology education programs can consider the recommendations of the SCANS report when setting curriculum standards.
14.	Business and industry can provide industry-developed curricula for use in developing or modifying portions of the secondary technology education curriculum.
15.	Business and industry and technology education representatives can engage in ongoing dialogue to clarify business and industry needs and requirements.

(table continues)

No.	Activity
16.	Business and industry personnel and technology educators can collaborate on the design of career awareness materials or training which can be used in secondary technology education programs and in continuing education/employee development initiatives in local businesses.
17.	Students can participate in internships with business and industry to discover the relevance of the secondary technology education curriculum.
18.	Discussions and "show and tell" sessions can be conducted involving teachers of math, science, computer education, and technology education along with training and development personnel from business and industry to learn of remediation efforts and curriculum redevelopment efforts.
19.	Businesses can review curricula at all levels, beginning with local elementary schools.
20.	Business and industry personnel can serve on state curriculum committees.
21.	Technology education programs can get help through the local Chamber of Commerce in order to identify industries that may volunteer to review curricula.
22.	Joint meetings can be held that include secondary, post-secondary, and business personnel to discuss course content, revisions, etc in order to keep curricula current.
23.	Business personnel can provide insight to common problems in their business to create curricula that will help develop problem-solving skills.

(table continues)

No.	Activity
24.	Business and industry personnel can attend seminars and address how to teach SCANS skills as well as other skills that are needed for entry-level employment.

Table 2

Partnership Activities Identified by the Combined Panel in Round One Related to Supplies, Materials, and Equipment

No.	Activity
25.	State Department of Education personnel can be utilized to locate industries willing to make donations to secondary technology education programs.
26.	Local industry can bring equipment to the technology education laboratory and demonstrate its uses.
27.	Business and industry can donate obsolete equipment that may still be useful in the technology education laboratory situation.
28.	Business and industry can loan equipment to the technology education program on a short-term basis for the purpose of instruction.
29.	Business and industry can provide technology educators with a list of materials available for purchase through their local suppliers, so that the technology education program can benefit from the volume purchasing power of a major industry.
30.	Business and industry personnel wishing to donate new equipment to technology education programs can visit other programs utilizing the equipment in order to see it in use.
31.	Business and industry can provide supplies, materials, and equipment for use in technology education laboratories.

(table continues)

No.	Activity
32.	Business and industry can assist technology education programs in keeping their equipment modern and up to date.
33.	Business and industry can donate outdated or worn out equipment to technology education programs to be "cannibalized" for parts.
34.	Business and industry personnel can provide maintenance or repair of equipment in the technology education laboratory at reduced cost or at no charge to the school.
35.	Business and industry and the school system can provide for a "pooling" of resources that each has, including technical expertise in different areas.
36.	Technology education teachers can provide industry with a list of "needs," while business and industry can circulate a list of available materials such as paper products, chemicals, equipment, etc.
37.	Businesses that are not partners can be contacted by members of the partnership regarding the availability of useable materials by the technology education program.
38.	Technology educators can visit business sites before purchasing materials to see applications that more closely align new purchases to direct student applications.
39.	Business and industry can fund additions to the technical library at the school.
40.	Business and industry can provide computers on a lease basis to schools or donate computers as upgrades are purchased.
41.	A yearly grant program can be developed through business and industry for purchasing equipment for the technology education program.

(table continues)

No.	Activity
42.	A system of proactive goals for replacing out-of-date equipment can be developed and implemented.
43.	A specific list of the yearly costs incurred in the technology education laboratory can be provided to sponsoring business and industry representatives.
44.	University programs can make donations to secondary technology education programs.
45.	Business and industry can provide funds to match those generated by technology education fund raisers.
46.	Business and industry can donate high tech parts and materials to be used as teaching aids in the technology education program.

Table 3

Partnership Activities Identified by the Combined Panel in Round One Related to Instruction or Staff Development

No.	Activity
47.	Business and industry can allow teachers to "shadow" professionals in the workplace.
48.	Business and industry can have engineers come to the technology education classroom in order to work with students on a problem-solving competition.
49.	Business and industry can provide opportunities for technology education teachers to attend industry-sponsored conferences and seminars.
50.	Business and industry could sponsor local Technology Student Association students in local, state, and national competition.

(table continues)

No.	Activity
51.	Business and industry could provide summer or co-op work for students in technology education classes.
52.	Business and industry can provide "shadowing" opportunities for students interested in specific careers.
53.	Business and industry can adopt a technology education program, providing some form of financial support for relevant instruction.
54.	Business and industry can provide opportunities for technology education students to access equipment at their facilities.
55.	Business and industry can offer technology education instructors seminars and workshops available through their organization.
56.	Tours of local industries can be made available to technology education teachers so that teachers can talk with personnel to see if their program represents "real technology" and is up to date.
57.	Business and industry can supply funds to send teachers to staff development workshops.
58.	Business and industry could sponsor technology education teachers in obtaining a higher degree at colleges and vocational training centers.
59.	Business and industry can provide resource personnel to serve as guest speakers at instructional in-service meetings.
60.	Business and industry can provide samples of work, ranging from high quality to poor quality to help students develop an understanding of quality control.
61.	Business and industry personnel can provide "mini-workshops" for technology education students covering areas such as use of equipment and safety.

(table continues)

No.	Activity
62.	Personnel from business and industry can visit the technology education laboratory in order to demonstrate the usage of particular pieces of equipment.
63.	Business and industry can provide workshops for teachers designed to train them on the usage of equipment during the summer.
64.	Business and industry can pay teachers for training during the summer.
65.	Business and industry can provide periodic training for teachers on software related to equipment used in the technology education lab.
66.	Business and industry can provide mentors and tutors for teachers and students.
67.	Technology educators can be exposed to new standard procedures used in business and industry, such as Statistical Process Control (SPC), so that they may develop an understanding of these procedures.
68.	Business and industry can afford technology educators with opportunities to participate in self-directed teams to observe skills required in the workplace.
69.	Business and industry can work with the State Department of Education in order to make sure that the teachers are aware of the dynamics of change that are occurring.
70.	Business and industry and technology education can encourage site-to-site exchanges--teachers into business and business into schools.
71.	Business and industry personnel can be involved in explaining career paths and explaining technical jobs to technology education students.

(table continues)

No.	Activity
72.	The technology education class can occasionally meet at the actual business sites.
73.	Business and industry can train educators in the "soft skills" of communication, team work, problem solving, decision making, higher order thinking, technology, etc.
74.	Technology educators can help business and industry train their employees in upgrading basic skills.
75.	Business and industry can conduct Total Quality Management (TQM) seminars at business sites.
76.	Business and industry can participate in the review and assessment of student performance--Did we hit the target? If so, how well? Are these students ready for life/work?
77.	Technology education programs and business and industry can provide school-to-work experiences for students.
78.	Businesses can bring technology education teachers into the workplace for a one-day look at what is required to run the business.
79.	Business and industry can invite and allow technology education teachers, administrators, and students to attend general management meetings and training sessions at the workplace.
80.	Business and industry personnel can provide models for assessment, drawn from best practice in industry, which may be adaptable for use in secondary technology education programs.
81.	Businesses and schools can collaborate to develop some joint instructional sessions in industry training areas during off-peak time periods.

(table continues)

No.	Activity
82.	Business and industry can provide seminars for *student teachers* giving them hands-on experience with current trends in the workplace.
83.	Technology educators and business and industry personnel can explore ways to combine classroom work with industry or business-based activities.
84.	Business and industry can provide site tours to provide students and the instructional staff with a first-hand look at a modern-day worksite.
85.	Business and industry can provide resource personnel to serve as guest speakers in the classroom.
86.	Individuals in business and industry can offer their expertise to the technology education instructor, either outside of or during class time.
87.	Video materials used in training/safety could be shared with local technology education instructors.
88.	Business and industry can allow technology education teachers to work with professionals through internships in the workplace in order to receive expert "on-the-job" training.
89.	Business and industry can get involved with the entire school to involve all staff and students through activities such as assemblies and faculty meetings.
90.	Personnel from business and industry can come to the classroom to teach certain areas of the curriculum.
91.	Personnel managers could provide information about resumes, job applications, and interview skills to participants in technology education programs.

(table continues)

No.	Activity
92.	Business and industry can provide part-time employees to supplement and assist present technology education staff.
93.	Tutoring labs staffed by business employees can be made available to technology education students and instructors on a weekly basis.
94.	Videos, slides, and presentations can be offered to technology education students concerning how and why technology is the "engine" driving the economic machine.
95.	Plant tours and discussion groups can be conducted between secondary education guidance counselors, career education personnel, and business and industry training and technical staffs.
96.	Local American Society for Training and Development (ASTD) chapters can host panel discussions on technology education/curriculum for faculty in local secondary schools.
97.	Local business and industry can sponsor a local "in-service points" program as mutually accepted by business and industry and the school system.
98.	Business and industry human resource representatives, along with the local American Society of Personnel Administrators (ASPA) can together create a video concerning speech and presentation skills for use in the technology education classroom or for transmission via satellite to multiple locations.
99.	Business and industry can present students with facts concerning how and why technology education leads to a "value added" economy and how essential it is to remain competitive in a global economy.

(table continues)

No.	Activity
100.	Business and industry can send printed information to be used by technology education students concerning technologies currently in use at local industries.
101.	Representatives from local business and industry can make presentations to local, district, or statewide groups of technology teachers.
102.	Businesses can provide intern opportunities for students to earn school credits, rather than monetary wages.
103.	Business and industry personnel can teach students study skills and time-management skills from grades 4-8.
104.	Business and industry personnel can actually attend training sessions with or for curriculum staff.
105.	Business and industry can train technology education teachers so that they may train other teachers.
106.	Business and industry can include technology education students in all processes of educating teachers and administrators in the area of technology.
107.	Business and industry can provide technology educators with a brief outline of activities or areas that can be covered in a given module.
108.	Technology education students can be required to interview their parents or friends about qualifications in various occupations in order to identify material that may be incorporated in the technology education curriculum.
109.	Vendors or suppliers can hold workshops for technology education teachers and business and industry personnel.

(table continues)

No.	Activity
110.	Technology education students can be offered extra credit for having their parents address the class concerning the nature of their work and their real-life experiences leading up to their choice of a career.
111.	Technology education students can work in small groups to brainstorm relevant questions and call various business and industry personnel regarding the qualifications of specific jobs.
112.	Technology students can "network" with various business and industry personnel through Internet or other educational computer networks.
113.	Teachers from business courses and career orientation courses can team teach with an emphasis on team activities and community resource speakers.
114.	Business personnel can provide technology education students with a list of educational and special training requirements for their respective fields.
115.	Business and industry can provide technology education programs with technical documentation and journals that are actually used in their industry.

Table 4

Partnership Activities Identified by the Combined Panel in Round One Related to Other Activities

No.	Activity
116.	Business and industry personnel can serve on local school boards.
117.	Business and industry can sponsor "science fair" type activities for technology education students.

(table continues)

No.	Activity
118.	Business and industry can adopt schools and reward them with donations for good performance.
119.	Cross-visitation programs can be set up between secondary and post-secondary schools that include guidelines and structured activities.
120.	Business and industry could adopt technology education programs and provide exposure in commercial and industrial publications.
121.	Business and industry can critique technology education laboratory situations/conditions and offer suggestions for improvement.
122.	Business and industry can offer labor or expertise in specific areas to set up or improve technology education laboratory facilities.
123.	Business personnel can serve on technology education advisory committees.
124.	Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.
125.	Business and industry can provide plaques, trophies, etc., for outstanding technology education students.
126.	Business and industry can provide an awards banquet for outstanding technology education students.
127.	Schools can "compare notes" on what they are receiving from business partners.
128.	Business and industry and technology education programs can work together to publicize successful programs in order to make the public aware of the program.

(table continues)

No.	Activity
129.	Business units can develop funds to support the partnership program so that funding is not a responsibility of the public school system.
130.	Business and industry can participate in local "Adopt A School" programs.
131.	Technology educators can guarantee that students can perform on the job. If not, educators retrain, not business.
132.	Technology education and business and industry can work jointly to set policy.
133.	Business and industry can support high school clubs that have economic or business relationships with the workplace.
134.	Business and industry representatives and technology educators can work together toward developing a mutual goal that is beneficial to both business and industry and the technology education program.
135.	Business and industry can provide opportunities for technology education students to be involved in community projects.
136.	Technology educators can work with students to explore meaningful ways for students to express appreciation for the help generously given by business and industry to the program.
137.	Lines of communication can be opened between proven "movers and shakers" from business and industry and technology education who have authority to make changes.
138.	Technology education students can produce employee incentive/recognition products, such as clocks or other items for businesses.
139.	Business and industry personnel and technology educators can serve on ad hoc committees.

(table continues)

No.	Activity
140.	Business and education committees can pay visits to vocational-technical school sites.
141.	A combined committee of technology education and business and industry representatives can form a partnership committee in order to provide ongoing reports.
142.	Business and industry can actively encourage schools to get involved with the Technology Student Association (TSA) or other vocational student organizations.
143.	Business and industry can provide technology education programs with up-to-date publications, journals, and videos such as "Beyond 2000" and "Invention".
144.	Technology education programs can publicize contributions made by business and industry through local news media.
145.	Business and industry personnel can assist technology educators in writing grants for external funding.
146.	Individual business and industry personnel can work with other school districts to research methods already being used successfully.
147.	Business and industry can sponsor and support Tech Prep programs that "tie" the secondary programs to the post-secondary programs.
148.	Technology education committees can pay visits to business and industry worksites.
149.	Technology educators can get on the mailing list of the American Society for Training and Development (ASTD).
150.	Business and industry and technology education programs can involve business associations, such as the American Society of Mechanical Engineers and the American Electrical Association in activities, when possible.

(table continues)

No.	Activity
151.	A specific list of requirements and up-to-date information regarding instructional staff can be provided to sponsoring business and industry representatives.
152.	Business and industry can work with technology education programs to identify and agree on outcomes and content standards, along with appropriate bench marks.
153.	A system for implementing change can be developed and instituted.

Results of Round Two

The questionnaire sent to each of the 36 panel members in round two included the 153 items previously identified by the panel members as appropriate parts of a partnership between secondary technology education programs and business and industry. Space was provided at the end of the questionnaire for additional activities not previously identified.

The questionnaire asked the panel members to circle the numerical rating that corresponded to their level of agreement as to the appropriateness of each of the items as part of a partnership between secondary technology education programs and business and industry. The numerical ratings to be used and their corresponding level of appropriateness were:

1 = Strongly **disagree**

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly **Agree**

Sixteen of the 18 technology education teachers on the panel returned the second questionnaire for a return rate of 88.8%. All eighteen of the business and industry representatives on the panel returned the second questionnaire for a return rate of 100%. The return rate for the combined panel was 94.4%. The questionnaire was returned by one of the technology education teachers too late to be included in the calculation of the statistics for the round. This panel member's responses were not included in the calculation of the combined panel's mean given for each item in the final round of the study or in the return rate calculation given for round 2.

Combined panel means ranged from a high of 4.88 out of a possible 5.00 to a low of 3.47 out of a possible 5.00. Based on the interpretation criteria found in Table 5, the means of all items rated by the combined panel fell within the categories of "neutral," "agree," or "strongly agree." No items fell into the "disagree" or "strongly disagree" categories based on the mean ratings of the combined panel.

Table 5

Mean Ratings Interpretation Criteria

Mean	Level of Agreement
4.51 - 5.00	Strongly Agree
3.51 - 4.50	Agree
2.51 - 3.50	Neutral
1.51 - 2.50	Disagree
1.00 - 1.50	Strongly Disagree

The items included on the round two questionnaire and their corresponding mean scores for the combined panel are given in Tables 6, 7, 8, and 9. The items are listed in descending order of the mean score and are grouped according to the areas used for the questions on the initial questionnaire: curriculum development and modification; supplies, materials, and equipment; instruction or staff development; and other activities.

Table 6

Combined Panel Mean Ratings for Partnership Activities from Round Two Related to Curriculum Development and Modification

$\bar{X}$	No.	Activity
4.76	1.	Business and industry can provide technology educators with information on the latest developments in supplies, materials, and equipment.
4.71	2.	Business and industry and technology education representatives can engage in ongoing dialogue to clarify business and industry needs and requirements.
4.65	3.	Business and industry and technology education programs can develop standards to ensure that partnerships are working and don't exist in name only.
4.59	4.	Business and industry can serve on advisory committees to help choose instructional materials as used in business.
4.53	5.	Business and industry can provide input into general and specific behavioral objectives for their future employees.
4.50	6.	Business and industry can be allowed and encouraged to provide input into the development of curriculum.
4.50	7.	Students can participate in internships with business and industry to discover the relevance of the secondary technology education curriculum.
4.47	8.	Business and industry can make suggestions regarding supplies, materials, and equipment used in the technology education program.

(table continues)

$\bar{X}$	No.	Activity
4.47	9.	Business and industry personnel and technology educators can collaborate on the design of career awareness materials or training which can be used in secondary technology education programs and in continuing education/employee development initiatives in local businesses.
4.41	10.	Business and industry can provide general and specific training materials to be included in the curriculum.
4.41	11.	Business and industry representatives can make presentations to schools, community school boards, educators, etc., on the value, need, and benefits of changing curricula and teaching methods.
4.38	12.	Joint meetings can be held that include secondary, post-secondary, and business personnel to discuss course content, revisions, etc in order to keep curricula current.
4.35	13.	Business and industry personnel can tour school facilities in order to offer suggestions on curriculum changes.
4.35	14.	Discussions and "show and tell" sessions can be conducted involving teachers of math, science, computer education, and technology education along with training and development personnel from business and industry to learn of remediation efforts and curriculum redevelopment efforts.
4.29	15.	Business and industry personnel can review texts and suggest methods of applications of theory to the real world/work.

(table continues)

$\bar{X}$	No.	Activity
4.29	16.	Business and industry personnel can serve on state curriculum committees.
4.29	17.	Business personnel can provide insight to common problems in their business to create curricula that will help develop problem-solving skills.
4.24	18.	Business and industry can participate on school board curriculum committees.
4.24	19.	Technology education programs can get help through the local Chamber of Commerce in order to identify industries that may volunteer to review curricula.
4.12	20.	Technology education programs can consider the recommendations of the SCANS report when setting curriculum standards.
4.12	21.	Business and industry can provide industry-developed curricula for use in developing or modifying portions of the secondary technology education curriculum.
4.06	22.	Businesses can review curricula at all levels, beginning with local elementary schools.
4.03	23.	Business and industry can create curricula for the equipment used in the classroom with the input of the classroom teachers.
3.97	24.	Business and industry personnel can attend seminars and address how to teach SCANS skills as well as other skills that are needed for entry-level employment.

Table 7

Combined Panel Mean Ratings for Partnership Activities from Round Two Related to Supplies, Materials, and Equipment

$\bar{X}$	No.	Activity
4.65	1.	Business and industry can assist technology education programs in keeping their equipment modern and up to date.
4.56	2.	Business and industry can provide supplies, materials, and equipment for use in technology education laboratories.
4.44	3.	Local industry can bring equipment to the technology education laboratory and demonstrate its uses.
4.41	4.	Business and industry can provide technology educators with a list of materials available for purchase through their local suppliers, so that the technology education program can benefit from the volume purchasing power of a major industry.
4.41	5.	Business and industry personnel wishing to donate new equipment to technology education programs can visit other programs utilizing the equipment in order to see it in use.
4.38	6.	Technology education teachers can provide industry with a list of "needs," while business and industry can circulate a list of available materials such as paper products, chemicals, equipment, etc.
4.32	7.	Business and industry and the school system can provide for a "pooling" of resources that each has, including technical expertise in different areas.

(table continues)

$\bar{X}$	No.	Activity
4.32	8.	Technology educators can visit business sites before purchasing materials to see applications that more closely align new purchases to direct student applications.
4.29	9.	A yearly grant program can be developed through business and industry for purchasing equipment for the technology education program.
4.26	10.	Business and industry can donate high tech parts and materials to be used as teaching aids in the technology education program.
4.21	11.	A system of proactive goals for replacing out-of-date equipment can be developed and implemented.
4.12	12.	Business and industry can loan equipment to the technology education program on a short-term basis for the purpose of instruction.
4.09	13.	Businesses that are not partners can be contacted by members of the partnership regarding the availability of useable materials by the technology education program.
4.09	14.	Business and industry can fund additions to the technical library at the school.
4.06	15.	University programs can make donations to secondary technology education programs.
4.03	16.	Business and industry can donate obsolete equipment that may still be useful in the technology education laboratory situation.

(table continues)

$\bar{X}$	No.	Activity
4.00	17.	Business and industry personnel can provide maintenance or repair of equipment in the technology education laboratory at reduced cost or at no charge to the school.
3.97	18.	Business and industry can provide computers on a lease basis to schools or donate computers as upgrades are purchased.
3.94	19.	A specific list of the yearly costs incurred in the technology education laboratory can be provided to sponsoring business and industry representatives.
3.91	20.	Business and industry can donate outdated or worn out equipment to technology education programs to be "cannibalized" for parts.
3.88	21.	Business and industry can provide funds to match those generated by technology education fund raisers.
3.79	22.	State Department of Education personnel can be utilized to locate industries willing to make donations to secondary technology education programs.

Table 8

Combined Panel Mean Ratings for Partnership Activities from Round Two Related to Instruction or Staff Development

$\bar{X}$	No.	Activity
4.88	1.	Business and industry personnel can actually attend training sessions with or for curriculum staff.
4.68	2.	Business and industry can provide resource personnel to serve as guest speakers in the classroom.

(table continues)

$\bar{X}$	No.	Activity
4.65	3.	Business and industry can provide site tours to provide students and the instructional staff with a first-hand look at a modern-day worksite.
4.62	4.	Business and industry can provide resource personnel to serve as guest speakers at instructional in-service meetings.
4.59	5.	Personnel managers could provide information about resumes, job applications, and interview skills to participants in technology education programs.
4.56	6.	Business and industry could provide summer or co-op work for students in technology education classes.
4.56	7.	Tours of local industries can be made available to technology education teachers so that teachers can talk with personnel to see if their program represents "real technology" and is up to date.
4.55	8.	Individuals in business and industry can offer their expertise to the technology education instructor, either outside of or during class time.
4.53	9.	Business and industry can provide "shadowing" opportunities for students interested in specific careers.
4.53	10.	Business and industry personnel can be involved in explaining career paths and explaining technical jobs to technology education students.
4.50	11.	Business and industry can provide opportunities for technology education teachers to attend industry-sponsored conferences and seminars.

(table continues)

$\bar{X}$	No.	Activity
4.50	12.	Technology education programs and business and industry can provide school-to-work experiences for students.
4.47	13.	Business and industry can have engineers come to the technology education classroom in order to work with students on a problem-solving competition.
4.47	14.	Business and industry can provide samples of work, ranging from high quality to poor quality to help students develop an understanding of quality control.
4.47	15.	Businesses can bring technology education teachers into the workplace for a one-day look at what is required to run the business.
4.47	16.	Video materials used in training/safety could be shared with local technology education instructors.
4.44	17.	Business and industry can provide mentors and tutors for teachers and students.
4.41	18.	Business and industry can allow teachers to "shadow" professionals in the workplace.
4.41	19.	Personnel from business and industry can visit the technology education laboratory in order to demonstrate the usage of particular pieces of equipment.
4.38	20.	Business and industry could sponsor local Technology Student Association students in local, state, and national competition.

(table continues)

$\bar{X}$	No.	Activity
4.38	21.	Business and industry personnel can provide "mini-workshops" for technology education students covering areas such as use of equipment and safety.
4.38	22.	Technology educators can be exposed to new standard procedures used in business and industry, such as Statistical Process Control (SPC), so that they may develop an understanding of these procedures.
4.38	23.	Business and industry and technology education can encourage site-to-site exchanges--teachers into business and business into schools.
4.38	24.	Plant tours and discussion groups can be conducted between secondary education guidance counselors, career education personnel, and business and industry training and technical staffs.
4.35	25.	Representatives from local business and industry can make presentations to local, district, or statewide groups of technology teachers.
4.33	26.	Business personnel can provide technology education students with a list of educational and special training requirements for their respective fields.
4.30	27.	Technology educators and business and industry personnel can explore ways to combine classroom work with industry or business-based activities.
4.29	28.	Teachers from business courses and career orientation courses can team teach with an emphasis on team activities and community resource speakers.

(table continues)

$\bar{X}$	No.	Activity
4.26	29.	Business and industry can offer technology education instructors seminars and workshops available through their organization.
4.26	30.	Business and industry can provide workshops for teachers designed to train them on the usage of equipment during the summer.
4.26	31.	Business and industry can train educators in the "soft skills" of communication, team work, problem solving, decision making, higher order thinking, technology, etc.
4.24	32.	Business and industry can provide seminars for *student teachers* giving them hands-on experience with current trends in the workplace.
4.24	33.	Technology education students can work in small groups to brainstorm relevant questions and call various business and industry personnel regarding the qualifications of specific jobs.
4.21	34.	Business and industry can adopt a technology education program, providing some form of financial support for relevant instruction.
4.21	35.	The technology education class can occasionally meet at the actual business sites.
4.21	36.	Technology educators can help business and industry train their employees in upgrading basic skills.
4.21	37.	Business and industry can allow technology education teachers to work with professionals through internships in the workplace in order to receive expert "on-the-job" training.

(table continues)

$\bar{X}$	No.	Activity
4.18	38.	Business and industry can provide opportunities for technology education students to access equipment at their facilities.
4.18	39.	Videos, slides, and presentations can be offered to technology education students concerning how and why technology is the "engine" driving the economic machine.
4.18	40.	Business and industry can provide technology education programs with technical documentation and journals that are actually used in their industry.
4.16	41.	Business and industry can present students with facts concerning how and why technology education leads to a "value added" economy and how essential it is to remain competitive in a global economy.
4.16	42.	Technology students can "network" with various business and industry personnel through Internet or other educational computer networks.
4.15	43.	Business and industry can provide periodic training for teachers on software related to equipment used in the technology education lab.
4.12	44.	Business and industry can afford technology educators with opportunities to participate in self-directed teams to observe skills required in the workplace.
4.12	45.	Business and industry can conduct Total Quality Management (TQM) seminars at business sites.

(table continues)

$\bar{X}$	No.	Activity
4.12	46.	Business and industry can send printed information to be used by technology education students concerning technologies currently in use at local industries.
4.09	47.	Businesses and schools can collaborate to develop some joint instructional sessions in industry training areas during off-peak time periods.
4.09	48.	Personnel from business and industry can come to the classroom to teach certain areas of the curriculum.
4.06	49.	Business and industry can invite and allow technology education teachers, administrators, and students to attend general management meetings and training sessions at the workplace.
4.06	50.	Vendors or suppliers can hold workshops for technology education teachers and business and industry personnel.
4.03	51.	Business and industry personnel can provide models for assessment, drawn from best practice in industry, which may be adaptable for use in secondary technology education programs.
4.00	52.	Business and industry can work with the State Department of Education in order to make sure that the teachers are aware of the dynamics of change that are occurring.
3.94	53.	Business and industry can provide technology educators with a brief outline of activities or areas that can be covered in a given module.
3.91	54.	Business and industry can participate in the review and assessment of student performance--Did we hit the target? If so, how well? Are these students ready for life/work?

(table continues)

$\bar{X}$	No.	Activity
3.91	55.	Business and industry can get involved with the entire school to involve all staff and students through activities such as assemblies and faculty meetings.
3.85	56.	Local American Society for Training and Development (ASTD) chapters can host panel discussions on technology education/curriculum for faculty in local secondary schools.
3.85	57.	Businesses can provide intern opportunities for students to earn school credits, rather than monetary wages.
3.82	58.	Business and industry can train technology education teachers so that they may train other teachers.
3.79	59.	Business and industry could sponsor technology education teachers in obtaining a higher degree at colleges and vocational training centers.
3.76	60.	Business and industry can supply funds to send teachers to staff development workshops.
3.76	61.	Technology education students can be required to interview their parents or friends about qualifications in various occupations in order to identify material that may be incorporated in the technology education curriculum.
3.74	62.	Local business and industry can sponsor a local "in-service points" program as mutually accepted by business and industry and the school system.

(table continues)

$\bar{X}$	No.	Activity
3.71	63.	Technology education students can be offered extra credit for having their parents address the class concerning the nature of their work and their real-life experiences leading up to their choice of a career.
3.70	64.	Tutoring labs staffed by business employees can be made available to technology education students and instructors on a weekly basis.
3.68	65.	Business and industry human resource representatives, along with the local American Society of Personnel Administrators (ASPA) can together create a video concerning speech and presentation skills for use in the technology education classroom or for transmission via satellite to multiple locations.
3.62	66.	Business and industry personnel can teach students study skills and time-management skills from grades 4-8.
3.50	67.	Business and industry can provide part-time employees to supplement and assist present technology education staff.
3.50	68.	Business and industry can include technology education students in all processes of educating teachers and administrators in the area of technology.
3.47	69.	Business and industry can pay teachers for training during the summer.

Table 9

Combined Panel Mean Ratings for Partnership Activities from Round Two Related to Other Activities

$\bar{X}$	No.	Activity
4.62	1.	Business and industry can participate in local "Adopt A School" programs.
4.56	2.	Business personnel can serve on technology education advisory committees.
4.50	3.	Business and industry and technology education programs can work together to publicize successful programs in order to make the public aware of the program.
4.47	4.	Business and industry can sponsor and support Tech Prep programs that "tie" the secondary programs to the post-secondary programs.
4.42	5.	Business and industry can provide plaques, trophies, etc., for outstanding technology education students.
4.42	6.	Business and industry representatives and technology educators can work together toward developing a mutual goal that is beneficial to both business and industry and the technology education program.
4.38	7.	Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.
4.38	8.	Business and industry can provide an awards banquet for outstanding technology education students.

(table continues)

$\bar{X}$	No.	Activity
4.38	9.	Technology education committees can pay visits to business and industry worksites.
4.35	10.	Lines of communication can be opened between proven "movers and shakers" from business and industry and technology education who have authority to make changes.
4.35	11.	Business and education committees can pay visits to vocational-technical school sites.
4.32	12.	Business and industry can sponsor "science fair" type activities for technology education students.
4.32	13.	Business and industry can provide technology education programs with up-to-date publications, journals, and videos such as "Beyond 2000" and "Invention".
4.30	14.	Individual business and industry personnel can work with other school districts to research methods already being used successfully.
4.30	15.	A system for implementing change can be developed and instituted.
4.29	16.	Business and industry personnel can serve on local school boards.
4.29	17.	Technology education programs can publicize contributions made by business and industry through local news media.
4.24	18.	Business and industry can provide opportunities for technology education students to be involved in community projects.

(table continues)

$\bar{X}$	No.	Activity
4.24	19.	Technology educators can work with students to explore meaningful ways for students to express appreciation for the help generously given by business and industry to the program.
4.18	20.	Business and industry can adopt schools and reward them with donations for good performance.
4.18	21.	Cross-visitation programs can be set up between secondary and post-secondary schools that include guidelines and structured activities.
4.18	22.	Business and industry and technology education programs can involve business associations, such as the American Society of Mechanical Engineers and the American Electrical Association in activities, when possible.
4.15	23.	Business and industry can critique technology education laboratory situations/conditions and offer suggestions for improvement.
4.15	24.	Business and industry can actively encourage schools to get involved with the Technology Student Association (TSA) or other vocational student organizations.
4.15	25.	Business and industry personnel can assist technology educators in writing grants for external funding.
4.12	26.	Business and industry could adopt technology education programs and provide exposure in commercial and industrial publications.
4.12	27.	Business and industry can offer labor or expertise in specific areas to set up or improve technology education laboratory facilities.

(table continues)

$\bar{X}$	No.	Activity
4.09	28.	Technology educators can get on the mailing list of the American Society for Training and Development (ASTD).
4.06	29.	A combined committee of technology education and business and industry representatives can form a partnership committee in order to provide ongoing reports.
4.06	30.	A specific list of requirements and up-to-date information regarding instructional staff can be provided to sponsoring business and industry representatives.
4.03	31.	Schools can "compare notes" on what they are receiving from business partners.
4.03	32.	Business and industry can support high school clubs that have economic or business relationships with the workplace.
4.00	33.	Business and industry can work with technology education programs to identify and agree on outcomes and content standards, along with appropriate bench marks.
3.97	34.	Business and industry personnel and technology educators can serve on ad hoc committees.
3.79	35.	Technology education and business and industry can work jointly to set policy.
3.76	36.	Business units can develop funds to support the partnership program so that funding is not a responsibility of the public school system.
3.61	37.	Technology educators can guarantee that students can perform on the job. If not, educators retrain, not business.

(table continues)

$\bar{X}$	No.	Activity
3.59	38.	Technology education students can produce employee incentive/recognition products, such as clocks or other items for businesses.

No additional activities were added to the questionnaire by any of the panel members. Several of the respondents used the additional activities section of the questionnaire to make general comments in regards to the time necessary for completion. Several others commented on the quality of the activities suggested on the questionnaire as favorable.

Results of Round Three

The questionnaire sent to each of the 36 panel members in round three contained the 153 activities that were included on the questionnaire used in round two of this study. In round three, each panel member was given their previous rating for each item, along with the combined panel's mean rating for each item. In addition, each item in which the response varied by two or more from the panel's mean rating was highlighted in order to bring particular attention to the item. Panel members were requested to reconsider each item and either retain their previous rating or change their rating if they wished in order to move it closer to the panel's mean rating.

Respondents were asked to state briefly why they felt that their rating was appropriate if they did not wish to change highlighted items. If the respondent did not rate a particular item during the previous round, a note was made on the item on the third questionnaire. Space was given for panel members to add additional activities or to make comments at the end of the questionnaire.

All eighteen of the technology education teachers on the panel returned the questionnaire, for a return rate of 100%. All eighteen of the business and industry representatives returned the questionnaire, for a return rate of 100%. No new activities were identified or dropped in round three.

Consensus was considered to have been reached when at least 51% of the respondents rated an item within plus or minus one point of the median rating on the Likert-type scale. Consensus was reached on all activities by the panel of technology education teachers, as well as by the combined panel of technology education teachers and business and industry representatives. Consensus was reached on all activities by the panel of business and industry representatives, except for one item, number 63, relating to instruction or staff development (see Table 12).

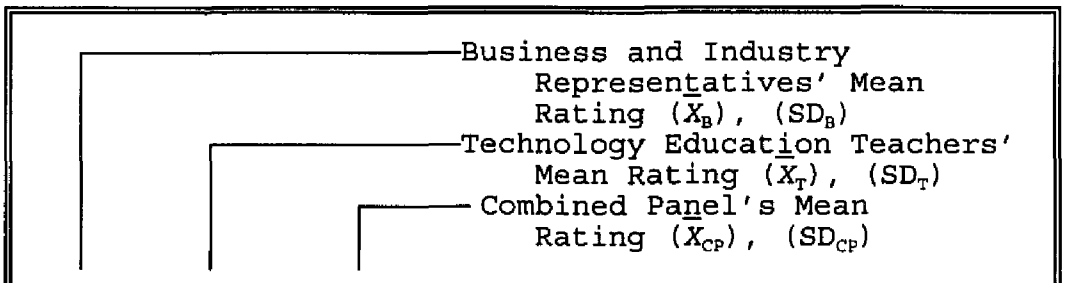
The mean scores for the combined panel, secondary technology education teacher panel, and business and industry representative panel are given for each item in Tables 10, 11, 12, and 13. The items are listed in descending order of the combined panel's mean score and are grouped according to the areas used for the questions on the initial questionnaire. Mean ratings should be interpreted using the criteria given in Table 5 on page 62.

Based on mean ratings as given in Table 10, each of the three panels rated the 24 activities related to curriculum development and modification as either strongly agree or agree. The items that were rated the highest primarily concerned activities that involved the provision of information to technology education programs by business and industry regarding emerging technology and the need for dialogue between the two groups in order to clarify the needs of business and industry. In addition, activities that involved the setting of standards, business and industry involvement in the development of specific behavioral objectives, and the provision of student internship opportunities were rated highly by the combined panel. As a general rule, the business and industry representatives' ratings were higher than those

of the secondary technology education teachers on the items with the highest appropriateness rating.

Table 10

Mean Ratings for Partnership Activities from Round Three Related to Curriculum Development and Modification



$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.78 0.48	4.78 0.50	4.78 0.50	1. Business and industry can provide technology educators with information on the latest developments in supplies, materials, and equipment.
4.83 0.51	4.61 0.51	4.72 0.50	2. Business and industry and technology education representatives can engage in ongoing dialogue to clarify business and industry needs and requirements.
4.67 0.46	4.67 0.61	4.67 0.56	3. Business and industry and technology education programs can develop standards to ensure that partnerships are working and don't exist in name only.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.72 0.46	4.50 0.51	4.61 0.49	4. Business and industry can serve on advisory committees to help choose instructional materials as used in business.
4.67 0.69	4.50 0.71	4.58 0.69	5. Students can participate in internships with business and industry to discover the relevance of the secondary technology education curriculum.
4.72 0.43	4.39 0.43	4.56 0.42	6. Business and industry can provide input into general and specific behavioral objectives for their future employees.
4.67 0.52	4.39 0.51	4.53 0.51	7. Business and industry can be allowed and encouraged to provide input into the development of curriculum.
4.50 0.54	4.50 0.62	4.50 0.57	8. Business and industry can make suggestions regarding supplies, materials, and equipment used in the technology education program.
4.50 0.59	4.50 0.48	4.50 0.53	9. Business and industry personnel and technology educators can collaborate on the design of career awareness materials or training which can be used in secondary technology education programs and in continuing education/employee development initiatives in local businesses.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.44 0.85	4.50 0.59	4.47 0.72	10. Business and industry can provide general and specific training materials to be included in the curriculum.
4.33 0.62	4.50 0.69	4.42 0.65	11. Business and industry personnel can tour school facilities in order to offer suggestions on curriculum changes.
4.39 0.98	4.44 0.62	4.42 0.81	12. Business and industry representatives can make presentations to schools, community school boards, educators, etc., on the value, need, and benefits of changing curricula and teaching methods.
4.33 0.73	4.44 0.76	4.39 0.75	13. Discussions and "show and tell" sessions can be conducted involving teachers of math, science, computer education, and technology education along with training and development personnel from business and industry to learn of remediation efforts and curriculum redevelopment efforts.
4.39 0.55	4.33 0.58	4.36 0.56	14. Business and industry personnel can review texts and suggest methods of applications of theory to the real world/work.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.22 0.38	4.50 0.50	4.36 0.45	15. Joint meetings can be held that include secondary, post-secondary, and business personnel to discuss course content, revisions, etc in order to keep curricula current.
4.17 0.51	4.50 0.51	4.33 0.51	16. Business personnel can provide insight to common problems in their business to create curricula that will help develop problem-solving skills.
4.39 0.48	4.22 0.51	4.31 0.50	17. Business and industry personnel can serve on state curriculum committees.
4.17 0.69	4.33 0.78	4.25 0.73	18. Business and industry can participate on school board curriculum committees.
4.22 0.90	4.28 0.67	4.25 0.81	19. Technology education programs can get help through the local Chamber of Commerce in order to identify industries that may volunteer to review curricula.
4.22 0.50	4.11 0.55	4.17 0.52	20. Business and industry can provide industry-developed curricula for use in developing or modifying portions of the secondary technology education curriculum.
4.06 0.73	4.17 0.57	4.11 0.65	21. Business and industry can create curricula for the equipment used in the classroom with the input of the classroom teachers.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
3.89 0.65	4.28 0.51	4.08 0.59	22. Businesses can review curricula at all levels, beginning with local elementary schools.
4.22 0.71	3.89 0.51	4.06 0.63	23. Technology education programs can consider the recommendations of the SCANS report when setting curriculum standards.
4.00 0.84	3.83 1.04	3.92 0.94	24. Business and industry personnel can attend seminars and address how to teach SCANS skills as well as other skills that are needed for entry-level employment.

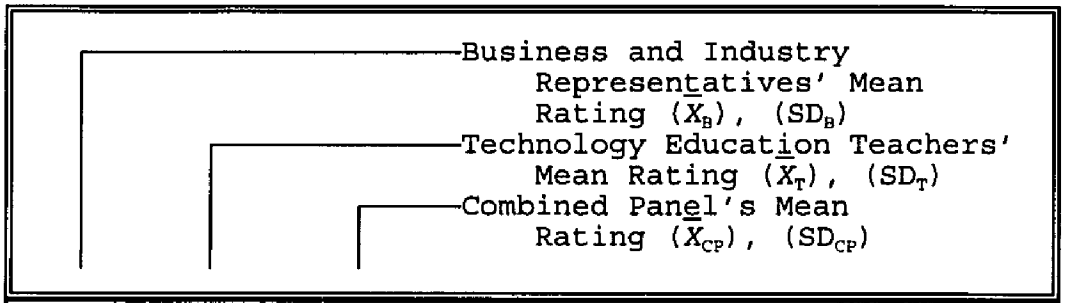
Based on mean ratings as given in Table 11, the combined panel and the panel of secondary technology education teachers rated the 22 activities related to supplies, materials, and equipment as either strongly agree or agree. The panel of business and industry representatives rated 20 of the activities related to supplies, materials, and equipment as agree and 2 items as neutral.

The items that were rated highest by the combined panel were primarily general in nature in regards to the provision of supplies, materials, and equipment to the technology education programs. The panel of secondary technology education teachers tended to rate items in this category higher than did their business and industry

counterparts. Item relating to the provision funds to technology education programs by business and industry generally received a relatively low rating by the panel of business and industry representatives.

Table 11

Mean Ratings for Partnership Activities from Round Three Related to Supplies, Materials, and Equipment



$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.44 1.08	4.89 0.98	4.67 1.10	1. Business and industry can assist technology education programs in keeping their equipment modern and up to date.
4.28 0.86	4.94 0.38	4.61 0.74	2. Business and industry can provide supplies, materials, and equipment for use in technology education laboratories.
4.17 1.24	4.83 1.34	4.50 1.27	3. Local industry can bring equipment to the technology education laboratory and demonstrate its uses.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.11 0.92	4.89 1.00	4.50 0.95	4. Business and industry personnel wishing to donate new equipment to technology education programs can visit other programs utilizing the equipment in order to see it in use.
4.33 0.77	4.50 0.51	4.42 0.65	5. Business and industry can provide technology educators with a list of materials available for purchase through their local suppliers, so that the technology education program can benefit from the volume purchasing power of a major industry.
4.11 0.83	4.67 0.47	4.39 0.77	6. Technology education teachers can provide industry with a list of "needs," while business and industry can circulate a list of available materials such as paper products, chemicals, equipment, etc.
4.22 0.83	4.56 0.24	4.39 0.69	7. Technology educators can visit business sites before purchasing materials to see applications that more closely align new purchases to direct student applications.
4.33 0.62	4.39 0.32	4.36 0.53	8. Business and industry and the school system can provide for a "pooling" of resources that each has, including technical expertise in different areas.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.00 0.84	4.67 1.41	4.33 1.15	9. A yearly grant program can be developed through business and industry for purchasing equipment for the technology education program.
4.06 0.83	4.56 0.96	4.31 0.93	10. Business and industry can donate high tech parts and materials to be used as teaching aids in the technology education program.
4.06 0.69	4.47 0.61	4.26 0.64	11. A system of proactive goals for replacing out-of-date equipment can be developed and implemented.
4.17 0.76	4.22 0.48	4.19 0.68	12. Business and industry can loan equipment to the technology education program on a short-term basis for the purpose of instruction.
4.06 0.72	4.28 0.57	4.17 0.65	13. Businesses that are not partners can be contacted by members of the partnership regarding the availability of useable materials by the technology education program.
3.78 0.55	4.50 0.51	4.14 0.55	14. Business and industry can fund additions to the technical library at the school.
4.00 0.81	4.17 0.86	4.08 0.90	15. Business and industry can donate obsolete equipment that may still be useful in the technology education laboratory situation.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.00 0.88	4.17 0.73	4.08 0.83	16. University programs can make donations to secondary technology education programs.
3.72 0.77	4.28 0.49	4.00 0.72	17. Business and industry personnel can provide maintenance or repair of equipment in the technology education laboratory at reduced cost or at no charge to the school.
3.78 0.54	4.22 0.51	4.00 0.57	18. Business and industry can provide computers on a lease basis to schools or donate computers as upgrades are purchased.
3.50 0.71	4.50 0.94	4.00 0.83	19. Business and industry can provide funds to match those generated by technology education fund raisers.
3.83 0.91	4.06 0.98	3.94 0.94	20. A specific list of the yearly costs incurred in the technology education laboratory can be provided to sponsoring business and industry representatives.
4.00 0.79	3.72 0.79	3.86 0.93	21. Business and industry can donate outdated or worn out equipment to technology education programs to be "cannibalized" for parts.
3.33 0.80	4.17 0.51	3.75 0.71	22. State Department of Education personnel can be utilized to locate industries willing to make donations to secondary technology education programs.

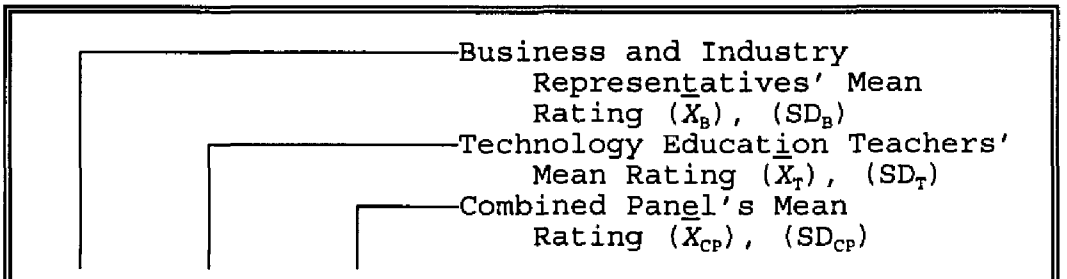
Based on mean ratings as given in Table 12, the combined panel and the panel of secondary technology education teachers rated 68 of the 69 activities related to instruction or staff development as either strongly agree or agree, with 1 item rated as neutral. The panel of business and industry representatives rated 64 of the 69 activities related to instruction or staff development as either strongly agree or agree, with 4 items rated as neutral. One item, number 53, lacked consensus with this group, therefore, the rating was disregarded in the above total.

The items that were rated the highest by the combined panel primarily involved the ability of business and industry to provide personnel to serve as guest speakers in the educational setting and to provide opportunities for school personnel and technology education students to visit the business sites. More specifically, the need for "shadowing" opportunities was addressed. The sharing of video materials relating to safety and instruction was also rated highly by both groups. Although all three panels were in general agreement with the majority of the activities given, ratings by the panel of secondary technology education teachers were generally higher than the ratings of the

panel of business and industry representatives in this category.

Table 12

Mean Ratings for Partnership Activities from Round Three Related to Instruction or Staff Development



$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.67 0.59	4.72 0.61	4.69 0.61	1. Business and industry can provide resource personnel to serve as guest speakers in the classroom.
4.56 0.50	4.78 0.50	4.67 0.51	2. Business and industry can provide site tours to provide students and the instructional staff with a first-hand look at a modern-day worksite.
4.56 0.51	4.72 0.50	4.64 0.51	3. Business and industry can provide resource personnel to serve as guest speakers at instructional in-service meetings.
4.44 0.79	4.72 0.70	4.58 0.76	4. Tours of local industries can be made available to technology education teachers so that teachers can talk with personnel to see if their program represents "real technology" and is up to date.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.56 0.62	4.61 0.46	4.58 0.55	5. Personnel managers could provide information about resumes, job applications, and interview skills to participants in technology education programs.
4.50 0.62	4.67 0.48	4.58 0.56	6. Individuals in business and industry can offer their expertise to the technology education instructor, either outside of or during class time.
4.44 0.92	4.67 0.48	4.56 0.84	7. Business and industry can provide "shadowing" opportunities for students interested in specific careers.
4.56 0.65	4.56 1.02	4.56 0.84	8. Business and industry personnel can be involved in explaining career paths and explaining technical jobs to technology education students.
4.44 0.64	4.61 0.62	4.53 0.67	9. Business and industry can provide opportunities for technology education teachers to attend industry-sponsored conferences and seminars.
4.44 0.62	4.61 0.46	4.53 0.55	10. Video materials used in training/safety could be shared with local technology education instructors.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.39 1.14	4.61 1.00	4.50 1.12	11. Business and industry can have engineers come to the technology education classroom in order to work with students on a problem-solving competition.
4.33 0.93	4.67 1.02	4.50 1.00	12. Business and industry can provide samples of work, ranging from high quality to poor quality to help students develop an understanding of quality control.
4.44 0.62	4.56 0.46	4.50 0.54	13. Technology education programs and business and industry can provide school-to-work experiences for students.
4.39 0.59	4.61 0.48	4.50 0.56	14. Businesses can bring technology education teachers into the workplace for a one-day look at what is required to run the business.
4.44 0.70	4.72 0.79	4.48 0.73	15. Business and industry could provide summer or co-op work for students in technology education classes.
4.33 0.75	4.61 0.61	4.47 0.70	16. Business and industry can allow teachers to "shadow" professionals in the workplace.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.39 0.68	4.50 0.70	4.44 0.70	17. Business and industry personnel can provide "mini-workshops" for technology education students covering areas such as use of equipment and safety.
4.28 1.08	4.61 0.91	4.44 1.08	18. Personnel from business and industry can visit the technology education laboratory in order to demonstrate the usage of particular pieces of equipment.
4.44 0.84	4.44 0.59	4.44 0.74	19. Business and industry can provide mentors and tutors for teachers and students.
4.39 0.62	4.44 0.70	4.42 0.65	20. Technology educators can be exposed to new standard procedures used in business and industry, such as Statistical Process Control (SPC), so that they may develop an understanding of these procedures.
4.39 0.61	4.39 0.78	4.39 0.69	21. Business and industry and technology education can encourage site-to-site exchanges--teachers into business and business into schools.
3.89 0.76	4.39 0.73	4.39 0.73	22. Plant tours and discussion groups can be conducted between secondary education guidance counselors, career education personnel, and business and industry training and technical staffs.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.17 0.87	4.56 0.80	4.36 0.83	23. Business and industry could sponsor local Technology Student Association students in local, state, and national competition.
4.28 0.61	4.39 0.61	4.33 0.60	24. Technology educators and business and industry personnel can explore ways to combine classroom work with industry or business-based activities.
4.33 0.51	4.33 0.51	4.33 0.51	25. Representatives from local business and industry can make presentations to local, district, or statewide groups of technology teachers.
4.11 0.61	4.56 0.64	4.33 0.64	26. Business personnel can provide technology education students with a list of educational and special training requirements for their respective fields.
4.06 0.61	4.56 0.79	4.31 0.71	27. Business and industry can offer technology education instructors seminars and workshops available through their organization.
4.17 0.54	4.44 0.62	4.31 0.58	28. Teachers from business courses and career orientation courses can team teach with an emphasis on team activities and community resource speakers.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.28 0.48	4.33 0.83	4.31 0.71	29. Business and industry can provide technology education programs with technical documentation and journals that are actually used in their industry.
4.39 0.77	4.17 0.96	4.28 0.86	30. Business and industry can train educators in the "soft skills" of communication, team work, problem solving, decision making, higher order thinking, technology, etc.
4.06 0.62	4.50 0.51	4.28 0.56	31. Business and industry can provide seminars for *student teachers* giving them hands-on experience with current trends in the workplace.
4.11 0.61	4.44 0.50	4.28 0.56	32. Business and industry can allow technology education teachers to work with professionals through internships in the workplace in order to receive expert "on-the-job" training.
3.83 0.76	4.67 0.77	4.25 0.76	33. Business and industry can adopt a technology education program, providing some form of financial support for relevant instruction.
4.22 0.65	4.28 0.60	4.25 0.62	34. Business and industry can provide opportunities for technology education students to access equipment at their facilities.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.11 0.72	4.39 0.55	4.25 0.64	35. Business and industry can provide workshops for teachers designed to train them on the usage of equipment during the summer.
4.39 0.72	4.06 0.51	4.22 0.66	36. The technology education class can occasionally meet at the actual business sites.
4.22 0.46	4.17 0.50	4.19 0.48	37. Technology educators can help business and industry train their employees in upgrading basic skills.
4.11 0.51	4.28 0.43	4.19 0.48	38. Technology education students can work in small groups to brainstorm relevant questions and call various business and industry personnel regarding the qualifications of specific jobs.
4.28 0.48	4.06 0.46	4.17 0.47	39. Business and industry can present students with facts concerning how and why technology education leads to a "value added" economy and how essential it is to remain competitive in a global economy.
4.00 0.51	4.33 0.48	4.17 0.50	40. Business and industry can provide periodic training for teachers on software related to equipment used in the technology education lab.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.11 0.51	4.22 0.61	4.17 0.56	41. Business and industry can afford technology educators with opportunities to participate in self-directed teams to observe skills required in the workplace.
4.22 0.90	4.11 0.62	4.17 0.78	42. Videos, slides, and presentations can be offered to technology education students concerning how and why technology is the "engine" driving the economic machine.
4.06 0.92	4.22 1.02	4.14 1.01	43. Businesses and schools can collaborate to develop some joint instructional sessions in industry training areas during off-peak time periods.
4.11 0.83	4.17 0.79	4.14 0.80	44. Personnel from business and industry can come to the classroom to teach certain areas of the curriculum.
4.33 0.62	3.89 0.50	4.11 0.55	45. Business and industry can conduct Total Quality Management (TQM) seminars at business sites.
4.22 1.10	4.00 0.83	4.11 1.03	46. Business and industry personnel can provide models for assessment, drawn from best practice in industry, which may be adaptable for use in secondary technology education programs.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.06 1.04	4.17 0.62	4.11 0.87	47. Business and industry can send printed information to be used by technology education students concerning technologies currently in use at local industries.
4.11 0.65	4.06 0.68	4.08 0.65	48. Vendors or suppliers can hold workshops for technology education teachers and business and industry personnel.
4.00 0.61	4.17 0.70	4.08 0.64	49. Technology students can "network" with various business and industry personnel through Internet or other educational computer networks.
4.06 0.77	4.06 0.78	4.06 0.79	50. Business and industry can work with the State Department of Education in order to make sure that the teachers are aware of the dynamics of change that are occurring.
4.11 0.88	4.00 0.80	4.06 0.83	51. Business and industry can invite and allow technology education teachers, administrators, and students to attend general management meetings and training sessions at the workplace.
4.00 0.89	3.89 0.92	3.94 0.89	52. Business and industry can participate in the review and assessment of student performance--Did we hit the target? If so, how well? Are these students ready for life/work?

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
3.61 0.57	4.28 0.64	3.94 0.61	53. Business and industry can get involved with the entire school to involve all staff and students through activities such as assemblies and faculty meetings.
3.89 0.64	3.89 0.62	3.89 0.62	54. Businesses can provide intern opportunities for students to earn school credits, rather than monetary wages.
3.78 0.48	4.00 0.48	3.89 0.48	55. Business and industry personnel can actually attend training sessions with or for curriculum staff.
3.72 1.02	4.06 0.96	3.89 1.09	56. Business and industry can provide technology educators with a brief outline of activities or areas that can be covered in a given module.
3.78 0.91	3.94 1.04	3.86 0.96	57. Local business and industry can sponsor a local "in-service points" program as mutually accepted by business and industry and the school system.
4.00 0.55	3.72 0.48	3.86 0.52	58. Business and industry can train technology education teachers so that they may train other teachers.
3.56 0.84	4.11 0.57	3.83 0.72	59. Business and industry could sponsor technology education teachers in obtaining a higher degree at colleges and vocational training centers.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.00 0.92	3.61 0.86	3.81 0.88	60. Local American Society for Training and Development (ASTD) chapters can host panel discussions on technology education/curriculum for faculty in local secondary schools.
3.83 1.02	3.78 0.64	3.81 0.85	61. Technology education students can be required to interview their parents or friends about qualifications in various occupations in order to identify material that may be incorporated in the technology education curriculum.
3.61 0.79	3.83 0.73	3.72 0.75	62. Technology education students can be offered extra credit for having their parents address the class concerning the nature of their work and their real-life experiences leading up to their choice of a career.
3.33 0.58	4.06 0.54	3.70 0.55	63. Business and industry can supply funds to send teachers to staff development workshops.

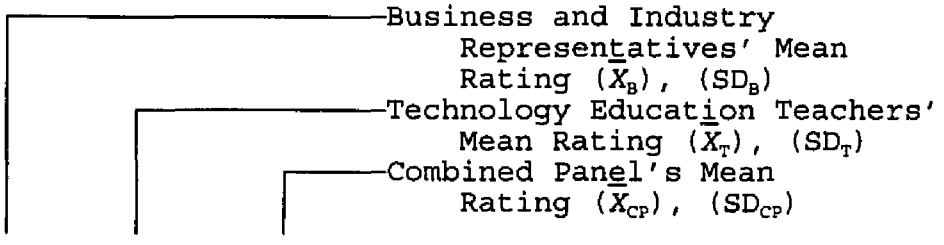
(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
3.72 1.09	3.61 0.92	3.67 1.00	64. Business and industry human resource representatives, along with the local American Society of Personnel Administrators (ASPA) can together create a video concerning speech and presentation skills for use in the technology education classroom or for transmission via satellite to multiple locations.
3.44 0.76	3.83 0.57	3.64 0.67	65. Tutoring labs staffed by business employees can be made available to technology education students and instructors on a weekly basis.
3.67 0.59	3.61 0.79	3.64 0.69	66. Business and industry personnel can teach students study skills and time-management skills from grades 4-8.
3.11 0.62	4.00 0.62	3.56 0.62	67. Business and industry can pay teachers for training during the summer.
3.17 0.68	3.89 0.51	3.53 0.64	68. Business and industry can provide part-time employees to supplement and assist present technology education staff.
3.50 0.46	3.44 0.59	3.47 0.52	69. Business and industry can include technology education students in all processes of educating teachers and administrators in the area of technology.

Based on mean ratings as given in Table 13, each of the panels rated the 38 activities related to other activities as either strongly agree or agree. The items that were rated the highest by each of the panels involved the participation of business and industry personnel in education advisory committees and "Adopt-A-School" programs. The need to publicize the successes of the partnership programs was also rated highly by the panels, in particular the panel of secondary technology education teachers. As in the other categories, the panel of business and industry representatives placed a lower rating on items that involved exchanges of funds than did the panel of secondary technology education teachers.

Table 13

Mean Ratings for Partnership Activities from Round Three Related to Other Activities



$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.50 1.00	4.67 0.78	4.58 0.89	1. Business personnel can serve on technology education advisory committees.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.56 0.57	4.61 0.61	4.58 0.59	2. Business and industry can participate in local "Adopt A School" programs.
4.39 0.90	4.56 0.49	4.47 0.82	3. Business and industry and technology education programs can work together to publicize successful programs in order to make the public aware of the program.
4.22 0.58	4.67 0.75	4.44 0.67	4. Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.
4.44 0.64	4.44 0.62	4.44 0.67	5. Business and industry can sponsor and support Tech Prep programs that "tie" the secondary programs to the post-secondary programs.
4.56 0.68	4.33 0.67	4.44 0.67	6. Technology education committees can pay visits to business and industry worksites.
4.06 0.59	4.72 0.59	4.39 0.60	7. Business and industry can provide plaques, trophies, etc., for outstanding technology education students.
4.44 0.62	4.28 0.59	4.36 0.60	8. Business and industry representatives and technology educators can work together toward developing a mutual goal that is beneficial to both business and industry and the technology education program.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.28 0.88	4.39 0.48	4.33 0.73	9. Business and industry can sponsor "science fair" type activities for technology education students.
4.22 0.80	4.44 0.46	4.33 0.73	10. Lines of communication can be opened between proven "movers and shakers" from business and industry and technology education who have authority to make changes.
4.06 0.86	4.61 0.70	4.33 0.79	11. Business and industry can provide technology education programs with up-to-date publications, journals, and videos such as "Beyond 2000" and "Invention".
4.06 1.00	4.61 0.69	4.33 0.89	12. Technology education programs can publicize contributions made by business and industry through local news media.
4.44 0.61	4.22 0.51	4.33 0.56	13. Individual business and industry personnel can work with other school districts to research methods already being used successfully.
4.22 1.27	4.39 0.76	4.31 1.12	14. Business and industry personnel can serve on local school boards.
4.17 0.71	4.44 0.50	4.31 0.61	15. Business and industry can provide an awards banquet for outstanding technology education students.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.33 1.08	4.28 1.07	4.31 1.12	16. Business and education committees can pay visits to vocational-technical school sites.
4.39 1.00	4.18 0.91	4.29 0.95	17. A system for implementing change can be developed and instituted.
4.28 0.78	4.28 0.73	4.28 0.76	18. Business and industry can provide opportunities for technology education students to be involved in community projects.
4.06 0.70	4.50 0.57	4.28 0.64	19. Technology educators can work with students to explore meaningful ways for students to express appreciation for the help generously given by business and industry to the program.
3.89 0.67	4.65 0.46	4.26 0.57	20. Business and industry can adopt schools and reward them with donations for good performance.
4.11 0.72	4.28 0.51	4.19 0.66	21. Cross-visitation programs can be set up between secondary and post-secondary schools that include guidelines and structured activities.
3.94 0.73	4.44 0.51	4.19 0.63	22. Business and industry could adopt technology education programs and provide exposure in commercial and industrial publications.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
4.11 0.70	4.28 1.19	4.19 0.96	23. Business and industry can critique technology education laboratory situations/conditions and offer suggestions for improvement.
3.94 0.73	4.44 0.83	4.19 0.81	24. Business and industry personnel can assist technology educators in writing grants for external funding.
4.17 0.67	4.22 0.67	4.19 0.67	25. Business and industry and technology education programs can involve business associations, such as the American Society of Mechanical Engineers and the American Electrical Association in activities, when possible.
4.00 0.83	4.33 0.84	4.17 0.82	26. Business and industry can offer labor or expertise in specific areas to set up or improve technology education laboratory facilities.
4.06 0.81	4.28 0.83	4.17 0.81	27. Business and industry can actively encourage schools to get involved with the Technology Student Association (TSA) or other vocational student organizations.
3.78 0.54	4.33 0.50	4.16 0.59	28. Schools can "compare notes" on what they are receiving from business partners.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
3.88 0.64	4.22 0.50	4.06 0.63	29. Business and industry can support high school clubs that have economic or business relationships with the workplace.
4.28 0.80	3.83 0.51	4.06 0.71	30. Technology educators can get on the mailing list of the American Society for Training and Development (ASTD).
4.18 0.51	3.94 0.65	4.06 0.59	31. A specific list of requirements and up-to-date information regarding instructional staff can be provided to sponsoring business and industry representatives.
4.06 0.78	4.00 0.62	4.03 0.69	32. A combined committee of technology education and business and industry representatives can form a partnership committee in order to provide ongoing reports.
4.17 0.51	3.83 0.48	4.00 0.50	33. Business and industry can work with technology education programs to identify and agree on outcomes and content standards, along with appropriate bench marks.
4.22 0.70	3.72 0.86	3.97 0.79	34. Business and industry personnel and technology educators can serve on ad hoc committees.
3.94 0.62	3.67 0.73	3.81 0.69	35. Technology education and business and industry can work jointly to set policy.

(table continues)

$\bar{X}_B$ SD_B	$\bar{X}_T$ SD_T	$\bar{X}_{CP}$ SD_{CP}	Item
3.28 0.64	4.11 0.54	3.69 0.59	36. Business units can develop funds to support the partnership program so that funding is not a responsibility of the public school system.
4.00 1.15	3.28 0.71	3.64 0.96	37. Technology educators can guarantee that students can perform on the job. If not, educators retrain, not business.
3.61 0.61	3.67 0.64	3.64 0.62	38. Technology education students can produce employee incentive/recognition products, such as clocks or other items for businesses.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to identify specific activities that were considered appropriate parts of a partnership between secondary technology education programs and the business and industry community. In addition, the study sought to determine the level of agreement with the appropriateness of the identified activities, ranging from strongly disagree to strongly agree.

A current review of the literature involving business and industry partnerships with education and technology education in particular was conducted, which provided the basis for the study. The study utilized a form of the Delphi Technique, in which 36 panel members were selected on the basis of experience and expertise in the field of education partnerships with business and industry. Two groups of panel members were selected, with one consisting of 18 business and industry representatives and one consisting of 18 technology education teachers.

Data for the study were collected through three rounds of questionnaires, which were mailed to the panel members. Round one consisted of open-ended questions that provided a list of 153 unique activities that might be

appropriate for partnerships between secondary technology education partnerships with business and industry. In round two, the panelists were asked to rate each of the activities derived from round one using a five point Likert-type scale. An opportunity was given for panelists to add new activities, but none were added. In round three, panelists were given their previous rating for each of the 153 items, along with the combined panel's mean score and were asked to reconsider each item and either change their previous rating or retain their previous rating, depending on their reconsideration. Consensus was reached on each of the 153 items by the combined panel and the panel of secondary technology education teachers. Consensus was reached on 152 items by the panel of business and industry representatives. Consensus was considered to have been reached when at least 51% of the respondents rated the item within one point of the median rating on the Likert-type scale. Based on the consensus and mean ratings for each group, the combined panel rated 152 of the activities as either "Strongly agree" or "Agree," while the panels of business and industry representatives and technology education teachers rated 146 and 151 of the activities, respectively, as either "Strongly agree" or "Agree."

Conclusions

Based on the objectives of this study, the following conclusions are made:

Objective One

To identify specific activities that are considered important parts of a collaborative partnership between secondary technology programs and members of the business and industry community as identified by the combined panel of technology educators and business and industry representatives from the southeastern region of the United States who have been active participants in education/business and industry partnerships.

Conclusions Based on Objective One

A. A combined panel of secondary technology education teachers and business and industry representatives that have previous experience with educational partnerships with business and industry are able to devise an extensive enumeration of activities that are appropriate to partnerships.

B. In devising the enumeration of activities, a large number of duplications will occur within the groups and across the groups.

C. The largest proportion of activities that are appropriate to partnerships between business and industry and secondary technology programs relate

to instruction or staff development, followed by activities related to the category of other activities.

D. The combined panel reflects the tendency of each of the separate groups to rate activities highest that are related to the exchange of information or personnel.

E. Activities related to goals and evaluation should be included in partnerships designed to ensure that the partnership is achieving its purpose.

F. Activities that provide for the use of business sites for internship and "shadowing" opportunities for students and educational personnel are appropriate for inclusion in a partnership between business and industry and secondary technology education programs.

G. Activities that provide for the use of guest speakers from business and industry to address educational groups are appropriate for inclusion in a partnership between business and industry and secondary technology education.

Objective Two

To identify specific activities that are considered important parts of a collaborative partnership between secondary technology education programs and members of the

business and industry community as identified by a panel of technology educators from the southeastern region of the United States who have been active participants in education/business and industry partnerships.

Conclusions Based on Objective Two

A. The largest proportion of activities appropriate to partnerships between business and industry and secondary technology education as rated by secondary technology education teachers relate to the category of instruction or staff development, followed by activities related to the category of other activities.

B. Secondary technology education teachers tend to be in strong agreement with numerous activities, as evidenced by a large number of activities rated as strongly agree (40) or agree (112).

C. Secondary technology education teachers rate activities the highest that are related to exchanges of information or personnel.

D. Secondary technology educators are likely to be in agreement with activities in which business and industry provides direct funding to the technology education program.

Objective Three

To identify specific activities that are considered important parts of a collaborative partnership between secondary technology programs and members of the business and industry community as identified by a panel of business and industry representatives from the southeastern region of the United States who have been active participants in education/business and industry partnerships.

Conclusions Based on Objective Three

A. The largest proportion of activities appropriate for partnerships between business and industry and secondary technology education programs as rated by business and industry representatives relate to the category of instruction or staff development, followed by activities related to the category of other activities.

B. Business and industry representatives are less robust in their agreement concerning partnership activities than secondary technology education teachers as evidenced by a smaller number of activities rated as strongly agree (14).

C. The activities rated highest by business and industry representatives generally relate to exchanges of information or personnel, especially

in regards to the development of standards and objectives.

D. Activities requiring donations or the direct provision of funds to the secondary technology education program were generally not rated as highly by the business and industry personnel as by the secondary technology education teachers.

Recommendations for Practice

Based on this study, the following recommendations for practice are made:

1. Based on mutually agreed upon objectives for the partnership, representatives of both business and industry and secondary technology education programs should engage in dialogue in order to determine the activities that will be included in their specific partnership.
2. Activities included in partnerships between technology education programs and business and industry may address a variety of activities and should not be limited to an exchange of funds or equipment. Based on the combined panel's ratings in round three of the study, exchanges of information and personnel should be strongly considered as part of most partnerships.

3. As confirmed in the literature and supported by the number of identified mutual activities, partnerships between business and industry and secondary technology education programs should be of mutual benefit to each of the partners.
4. Due to the large proportion of activities relating to instruction or staff development, activities should be present that are designed to enhance instruction or provide the teacher with staff development opportunities in most partnerships.
5. Visitations should be conducted between business and industry facilities and secondary technology education facilities during the planning and implementation stages of related partnerships in order to familiarize each entity involved in the partnership with an understanding of the needs and interests of the other party.
6. Technology educators should consider business and industry's reluctance to base partnerships heavily on financial donations as evidenced by relatively low ratings on activities of this nature.
7. Based on activities identified and their agreement ratings, evaluation should be an on-going and integral part of the partnership planning and implementation process. This should be done in

order to ensure that the partnership is operating effectively and efficiently.

8. Work site based learning should be considered as a possible secondary technology education partnership activity due to business and industry's willingness to provide sites for internships and "shadowing" opportunities for students and educational personnel.

Recommendations for additional research include:

1. the need to determine how to initiate, plan, implement, and evaluate a partnership between business and industry and secondary technology education programs once a decision has been made to do so;
2. the need for further refinement of the listing of activities identified in this study in order to determine their appropriateness, based on the objectives of specific types of partnerships;
3. the need to replicate this study with an emphasis on other vocational subject areas in order to identify and determine the appropriateness of partnership activities for those vocational subjects;

4. the need to replicate this study on a national basis in order to validate the generalizability of the findings.

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APPENDIX A
LETTER SENT TO TECHNOLOGY EDUCATION STATE SUPERVISORS

Date

1~
2~
3~
4~

Dear 5~

We are conducting a study related to specific activities that are considered appropriate parts of a partnership between secondary technology education programs and business and industry in the southeastern region of the United States. It is my hope that this study will serve as a starting point to define and strengthen these partnerships so that the students that are served by technology education programs will be better prepared to enter into the workplace or into post-secondary programs that are designed to further their career preparation.

I am writing to you to request your assistance in this endeavor. Would you please nominate five technology education teachers (two nominees and three alternates) from the state of 6~ to serve as members of my panel of experts? It is important that each of these teachers be involved in innovative, successful programs that reflect today's emphasis on technological systems and concept development, as defined by the technology education profession. It is also important that each of the teachers nominated have been active in partnership activities, either formal or informal with business and industry. I have provided a form for your response. Please return the nomination form no later than January 24, 1994. After receiving your nominations, I will contact each of the nominees to determine their willingness to participate in the study and to verify their involvement in previous partnership activities. Alternates will be contacted as needed.

1~
Page 2

If you feel that someone else in your department is more suited to make these nominations, please feel free to have them assist with the nomination process. Thank you in advance for your cooperation in this matter. If you have any questions regarding this information or any other aspects of the study, please contact me at (912) 333-5928.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education
Valdosta State University

James W. Trott
Major Professor
Associate Dean
College of Agriculture
Louisiana State University

APPENDIX B

NOMINATION FORM SENT TO TECHNOLOGY EDUCATION STATE SUPERVISORS

NOMINATION FORM

State _____

Nominee 1

Name-
Name of School-
School Address-

School Phone- ( )
Home Address-

Home Phone- ( )

==========

Nominee 2

Name-
Name of School-
School Address-

School Phone- ( )
Home Address-

Home Phone- ( )

==========

Alternate 1

Name-
Name of School-
School Address-

School Phone- ( )
Home Address-

Home Phone- ( )

==========

Alternate 2

Name-
Name of School-
School Address-

School Phone- ( )
Home Address-

Home Phone- ( )

==========

Alternate 3

Name-
Name of School-
School Address-

School Phone- ( )
Home Address-

Home Phone- ( )

APPENDIX C

FOLLOWUP LETTER SENT TO TECHNOLOGY EDUCATION STATE SUPERVISORS

Date

1~
2~
3~
4~

Dear 5~

Recently I contacted you concerning nominations for a research study related to specific activities that are considered appropriate parts of a partnership between secondary technology education programs and business and industry in the southeastern region of the United States. Please let me reaffirm how important your participation is to this study as you are in the position to provide the most reliable slate of nominees for the state of 6~

I hope that you can provide this information. Please be assured that nominees will not be asked to devote more than 20 or 30 minutes of their time during each of the three rounds of the data collection procedure. For your convenience, I have enclosed another nomination form. The form may be faxed to me at (912) 333-7167. If you have already sent the information, please accept my thanks. Please call me if you have any further questions or concerns about this project.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

Enclosure

APPENDIX D

LETTER OF REQUEST SENT TO SECONDARY TECHNOLOGY EDUCATION TEACHERS

Date

1~

Dear 2~

I am conducting a research study to determine the activities that are considered appropriate components of a partnership between business and industry and secondary technology education programs. The study will be conducted using the Delphi technique, which utilizes a panel of experts and the consensus process, in order to identify items that may be applicable to the objectives of the study.

You have been nominated as a possible member of this Delphi panel. Your nomination was based upon your association with technology education and past experiences in working with business and industry in order to improve your technology education program. The study will be comprised of three rounds of questionnaires. Each questionnaire will be designed to require a minimum of your time. As is common with this type of study, it is important that participants participate in each round. Please use the enclosed form to indicate whether or not you are willing to serve as a member of the panel. If you agree to serve, please briefly describe your past experiences dealing with activities related to business and industry and technology education on the enclosed form by Wednesday, April 13, 1994. A stamped, self-addressed envelope has been provided for your convenience.

If you have any questions concerning this study, please feel free to call me at (912) 333-5928. Thank you for your assistance with this project.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

APPENDIX E

ACCEPTANCE FORM SENT TO SECONDARY TECHNOLOGY EDUCATION TEACHERS

IDENTIFICATION OF DESIRED ACTIVITIES IN A PARTNERSHIP BETWEEN SECONDARY TECHNOLOGY EDUCATION PROGRAMS AND BUSINESS AND INDUSTRY

INTENT FORM

1~
2~

(Please make address and phone corrections above)

_____ **Yes**, I agree to be considered as a member of the Delphi panel.

_____ **No**, I do not agree to be considered as a member of the Delphi panel.

If you answered yes to the above statement, please describe your past experience in activities between secondary technology education and business and industry. Use an attachment, if necessary.

Please fill in your home address and phone number below. (This information is needed since the process may extend into the summer months).

Street _____

City, State, Zip _____

Home Phone (___)_____

Please return this form in the enclosed self addressed envelope no later than April 13, 1994 to:

Charles E. Backes
Department of Vocational Education
Valdosta State University
Valdosta, GA 31698

APPENDIX F

FOLLOWUP NOMINATION LETTER SENT TO SECONDARY TECHNOLOGY EDUCATION TEACHERS

Date

1~
2~
3~

Dear 4~

Several weeks ago, I sent you a letter inviting your participation in a research project concerning activities that are appropriate parts of a partnership between technology education programs and business and industry. Since I have not yet received your response to the initial letter, I am again requesting that you consider the possibility of participating in the study as a member of the research panel. As previously mentioned, you were nominated due to your involvement with technology education and activities related to business and industry . Because I realize that your schedule is quite busy throughout the year, the survey instruments will be designed to require a minimum of your time for completion.

I have enclosed a copy of the nomination form that I previously sent to you. Please take a moment to complete the nomination form and return it to me today in the enclosed self addressed, stamped envelope. Please contact me if you need further information concerning the study or the nomination process at (912) 333-5928. I am looking forward to receiving your response.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

APPENDIX G

LETTER SENT TO THE NAPE CONTACT PERSONS

Date

1~
2~
3~
4~

Dear 5~

We are conducting a study related to specific activities that are considered appropriate parts of a partnership between secondary technology education programs and business and industry in the southeastern region of the United States. It is my hope that this study will serve as a starting point to define and strengthen such partnerships so that the students who are served by technology education programs will be better prepared to enter into the workplace or into post-secondary programs that are designed to further their career preparation.

Due to your involvement with educational partnerships through the National Association of Partners in Education, I am writing to request your assistance in this endeavor. Would you please nominate five persons in the business and industry community (two nominees and three alternates) from the state of 6~ to serve as members of my panel of experts? It is important that each of your nominees has been involved in some type of business and industry/education partnership activities, preferably those which involve secondary school programs. I have provided a form for this information. Please return the nomination form no later than January 24, 1994. After receiving your nominations, I will contact each of the nominees to assess their willingness to participate in the study and to verify their involvement in previous partnership activities. Alternates will be contacted as needed, in the event that nominees are unable to participate in the study.

Thank you in advance for your cooperation in this matter. If you have any questions regarding this information or any other aspects of the study, please contact me at (912) 333-5928.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education
Valdosta State University

James W. Trott
Major Professor
Associate Dean
College of Agriculture
Louisiana State University

APPENDIX H

NOMINATION FORM SENT TO NAPE CONTACT PERSONS

NOMINATION FORM

State _____

Nominee 1

Name-
Name of Business-
Business Address-

Business Phone- ( )

==========

Nominee 2

Name-
Name of Business-
Business Address-

Business Phone- ( )

==========

Alternate 1

Name-
Name of Business-
Business Address-

Business Phone- ( )

==========

Alternate 2

Name-
Name of Business-
Business Address-

Business Phone- ( )

==========

Alternate 3

Name-
Name of Business-
Business Address-

Business Phone- ( )

APPENDIX I

FOLLOWUP LETTER SENT TO NAPE CONTACT PERSONS

Date

1~
2~
3~

Dear 4~

Recently I contacted you concerning business and industry nominations for a research study related to specific activities that are considered appropriate parts of a partnership between secondary technology education programs and business and industry in the southeastern region of the United States. Please let me reaffirm how important your participation is to this study as you are in the position to provide the most reliable slate of nominees for the state of 5~.

I hope that you can provide this information. Please be assured that nominees will not be asked to devote more than 20 or 30 minutes of their time during each of the three rounds of the data collection procedure. For your convenience, I have enclosed another nomination form. The form may be faxed to me at (912) 333-7167. If you have already sent the information, please accept my thanks. Please call me if you have any further questions or concerns about this project.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

Enclosure

APPENDIX J

LETTER OF REQUEST SENT TO BUSINESS AND INDUSTRY REPRESENTATIVES

Date

1~
2~

Dear 3~

I am conducting a research study to determine the activities that are considered appropriate components of a partnership between business and industry and secondary technology education programs in the southeastern United States. The study will be conducted using the Delphi technique, which utilizes a panel of experts in order to identify items that may be applicable to the objectives of the study.

You have been nominated as a possible member of this Delphi panel. Your nomination was based upon your association with business and industry and your work with educational partnerships. The study will be comprised of three rounds of questionnaires. Each questionnaire will be designed to require a minimum of your time to complete. As is common with this type of study, it is important that panelists participate in each round of this study. Please use the enclosed form to indicate whether or not you are willing to serve as a member of the panel. If you agree to serve, please briefly describe your past experiences dealing with activities related to business and industry and education by completing and returning the enclosed form no later than Wednesday, April 13, 1994. A stamped, self-addressed envelope has been provided for your convenience.

If you have any questions concerning this study, please feel free to call me at (912) 333-5928. Thank you for your assistance with this project.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

APPENDIX K

ACCEPTANCE FORM SENT TO BUSINESS AND INDUSTRY REPRESENTATIVES

IDENTIFICATION OF DESIRED ACTIVITIES IN A PARTNERSHIP BETWEEN SECONDARY TECHNOLOGY EDUCATION PROGRAMS AND BUSINESS AND INDUSTRY

INTENT FORM

<NAME>
<ADDRESS>
<PHONE>

(Please make address and phone corrections above)

_____ **Yes**, I agree to be considered as a member of the Delphi panel.

_____ **No**, I do not agree to be considered as a member of the Delphi panel.

If you answered yes to the above statement, please briefly describe your past experience in activities between education and business and industry. Use an attachment, if necessary.

Please return this form in the enclosed self addressed envelope no later than April 13, 1994 to:

Charles E. Backes
Department of Vocational Education
Valdosta State University
Valdosta, GA 31698

APPENDIX L

FOLLOWUP LETTER SENT TO BUSINESS AND INDUSTRY REPRESENTATIVES

Date

1~
2~
3~

Dear 4~

Several weeks ago, I sent you a letter inviting your participation in a research project concerning activities that are appropriate parts of a partnership between technology education programs and business and industry. Since I have not yet received your response to the initial letter, I am again requesting that you consider the possibility of participating in the study as a member of the research panel. As previously mentioned, you were nominated due to your involvement with education and activities related to business and industry. Because I realize that your schedule is quite busy throughout the year, the survey instruments will be designed to require a minimum of your time for completion.

I have enclosed a copy of the nomination form that I previously sent to you. Please take a moment to complete the nomination form and return it to me today in the enclosed self addressed, stamped envelope. Please contact me if you need further information concerning the study or the nomination process at (912) 333-5928. I am looking forward to receiving your response.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

APPENDIX M

ROUND ONE LETTER OF EXPLANATION

Date

1~
2~
3~

Dear 4~

Thank you for agreeing to participate in this technology education/business and industry partnership study. Your perspective is an invaluable component for the success of this study.

Specifically, we will identify those activities that may be considered appropriate parts of a partnership between secondary technology education programs and business and industry. The identification of these activities will be accomplished through a series of three questionnaires, beginning with the questionnaire that is included in this mailing. It is important that you return the questionnaires by the date requested and that you participate in each round.

The final results of this study will provide partnership planners with an enumeration of activities that they may draw upon when planning the details of a partnership between technology education and business and industry. A copy of the final list of activities will be provided to you, as a member of the panel, upon your request.

I have attached the first of the three questionnaires, along with information defining terms appropriate to this study. This questionnaire is designed to generate a list of activities that individual panel members feel are appropriate activities that may be included in a partnership between secondary technology education programs and business and industry. Please complete the questionnaire and return it to me by Wednesday, June 15, 1994. A self-addressed, stamped envelope has been included for your convenience.

Enclosed is a small gift as a token of my appreciation for your participation in this study. If you have questions concerning this round of the study, please call me at (912) 333-5928.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

Enclosures

APPENDIX N

GLOSSARY OF TERMS RELATED TO THE STUDY SENT IN ROUND ONE

Identification of Activities that are Appropriate Parts of a Partnership between Secondary Technology Education Programs and Business and Industry

Definition of Terms

For the purpose of this study, the following operational terms and definitions are given.

Business and Industry - Members of the commercial community responsible for the manufacture, distribution, purchase or sale of commodities, materials, equipment, or services.

Partnership - A collaborative effort between a school(s) or school district(s) and one or more community organizations with the purpose of improving the academic and personal growth of America's youth. (taken from "Meeting the Challenge: Using Partnerships as Catalysts for Change" by the National Association of Partners in Education, Inc.)

Southeastern United States - The region of the United States that includes the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee

Technology Education - The comprehensive curriculum area which has an action based instructional program concerned with technology, its evolution, utilization, and significance; with industry, its organization, personnel, systems, techniques, resources, and product; and their combined social and cultural impacts. (Starkweather, 1986). Emphasis is upon the development of concepts and understanding of materials and processes, not on specific job training.

Technology education content is generally drawn from the following areas (Starkweather, 1986):

> *Communication*-Efficiently using resources to transfer information to extend human potential.
>
> *Construction*-Efficiently using resources to build structures or constructed works on a site.
>
> *Manufacturing*-Efficiently using resources to extract and convert raw/recycled material into industrial and consumer goods.
>
> *Transportation*-Efficiently using resources to obtain time and place utility and to attain and

maintain direct physical contact and exchange among individuals and societal units through the movement of materials/goods and people.

Secondary Technology Education - Technology education programs involving students typically in grades 9, 10, 11, or 12.

APPENDIX O

ROUND ONE QUESTIONNAIRE

Identification of Activities that are Appropriate Parts of a Partnership between Secondary Technology Education Programs and Business and Industry

Round One Questionnaire

Instructions:

Please list as many activities that you can think of that you feel are appropriate for inclusion in a partnership between secondary technology education programs and business and industry. In answering the following questions, please consider the examples given as a guide for listing your activities. Please state your activities as briefly as possible. If you feel that no activities are appropriate for a particular question, please indicate "No activities are appropriate" below the question. Use the back of the form if more space is needed.

Question #1

What activities are appropriate for inclusion in a partnership between secondary technology education programs and business and industry *in regards to curriculum development and modification*?

example: Business personnel can serve on technology education advisory committees.

1.

2.

3.

4.

5.

6.

7.

8.

Question #2

What activities are appropriate for inclusion in a partnership between secondary technology education programs and business and industry *in regards to supplies, materials, and equipment*?

example: Business and industry can provide updated equipment for use in technology education laboratories

1.

2.

3.

4.

5.

6.

7.

8.

Question #3

What activities are appropriate for inclusion in a partnership between secondary technology education programs and business and industry *in regards to instruction or staff development*?

example: Business and industry can provide part time employment for technology education teachers in order for the teachers to remain up-to-date on industry standards.

1.

2.

3.

4.

5.

6.

7.

8.

Question #4

What activities are appropriate for inclusion in a partnership between secondary technology education programs and business and industry *in regards to areas not previously mentioned*?

example: Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.

1.

2.

3.

4.

5.

6.

7.

8.

Thanks for your prompt response. The next round of the study will be mailed shortly.

Please print your name and any address corrections below.

APPENDIX P

ROUND TWO LETTER OF EXPLANATION

Date

1~

Dear 2~

Enclosed is the second questionnaire in our study concerning activities that are appropriate parts of a partnership between secondary technology programs and business and industry. As you will see, the panelists have suggested quite an extensive variety of activities for your consideration.

I realize that your time is quite valuable; therefore, I have made every attempt to structure the questionnaire in such a manner that a minimum of your time will be required to complete it. The questionnaire is a compilation of activities suggested by the panelists involved in this study. You may notice that some of the activities that you suggested have been slightly reworded or combined with items from other finalists. I tried not to change the intent of any of the suggested items. If you feel that any of your items were left out or that the content of any of your items was compromised, please add the item to the end of the questionnaire. In addition, any other items that you did not include in the initial questionnaire, but now wish to suggest, can be added to the end of the questionnaire.

Please consider each of the items carefully and rate the appropriateness of the item using the scale on the left side of the document. The completed questionnaire may be returned to me in the stamped, self-addressed envelope which is also enclosed, or it may be faxed to me at (912) 333-7167. Since it is important that your responses be included in the next round of the study and so that the study may proceed efficiently, please return the questionnaire by Wednesday, August 3, 1994. If you have any questions relating to this study, please call me at (912) 333-5928.

Thanks again for your time and valuable assistance with this project. I am looking forward to receiving your response.

Sincerely

Charles E. Backes
Assistant Professor

Enclosures

APPENDIX Q

ROUND TWO QUESTIONNAIRE

Identification of Activities That Are Appropriate Parts of a Partnership Between Secondary Technology Education Programs and Business and Industry

Directions: For each of the items listed, please circle the numerical rating that corresponds with your level of agreement in regards to the appropriateness of the item.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	1.	Business and industry can be allowed and encouraged to provide input into the development of curriculum.
1	2	3	4	5	2.	Business and industry can provide general and specific training materials to be included in the curriculum.
1	2	3	4	5	3.	Business and industry can provide input into general and specific behavioral objectives for their future employees.
1	2	3	4	5	4.	Business and industry can serve on advisory committees to help choose instructional materials as used in business.
1	2	3	4	5	5.	Business and industry personnel can tour school facilities in order to offer suggestions on curriculum changes.
1	2	3	4	5	6.	Business and industry can provide technology educators with information on the latest developments in supplies, materials, and equipment.
1	2	3	4	5	7.	Business and industry can make suggestions regarding supplies, materials, and equipment used in the technology education program.
1	2	3	4	5	8.	Business and industry can create curricula for the equipment used in the classroom with the input of the classroom teachers.
1	2	3	4	5	9.	Business and industry and technology education programs can develop standards to ensure that partnerships are working and don't exist in name only.
1	2	3	4	5	10.	Business and industry personnel can review texts and suggest methods of applications of theory to the real world/work.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	11.	Business and industry can participate on school board curriculum committees.
1	2	3	4	5	12.	Business and industry representatives can make presentations to schools, community school boards, educators, etc., on the value, need, and benefits of changing curricula and teaching methods.
1	2	3	4	5	13.	Technology education programs can consider the recommendations of the SCANS report when setting curriculum standards.
1	2	3	4	5	14.	Business and industry can provide industry-developed curricula for use in developing or modifying portions of the secondary technology education curriculum.
1	2	3	4	5	15.	Business and industry and technology education representatives can engage in ongoing dialogue to clarify business and industry needs and requirements.
1	2	3	4	5	16.	Business and industry personnel and technology educators can collaborate on the design of career awareness materials or training which can be used in secondary technology education programs and in continuing education/employee development initiatives in local businesses.
1	2	3	4	5	17.	Students can participate in internships with business and industry to discover the relevance of the secondary technology education curriculum.
1	2	3	4	5	18.	Discussions and "show and tell" sessions can be conducted involving teachers of math, science, computer education, and technology education along with training and development personnel from business and industry to learn of remediation efforts and curriculum redevelopment efforts.
1	2	3	4	5	19.	Businesses can review curricula at all levels, beginning with local elementary schools.
1	2	3	4	5	20.	Business and industry personnel can serve on state curriculum committees.
1	2	3	4	5	21.	Technology education programs can get help through the local Chamber of Commerce in order to identify industries that may volunteer to review curricula.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	22.	Joint meetings can be held that include secondary, post-secondary, and business personnel to discuss course content, revisions, etc in order to keep curricula current.
1	2	3	4	5	23.	Business personnel can provide insight to common problems in their business to create curricula that will help develop problem-solving skills.
1	2	3	4	5	24.	Business and industry personnel can attend seminars and address how to teach SCANS skills as well as other skills that are needed for entry-level employment.
1	2	3	4	5	25.	State Department of Education personnel can be utilized to locate industries willing to make donations to secondary technology education programs.
1	2	3	4	5	26.	Local industry can bring equipment to the technology education laboratory and demonstrate its uses.
1	2	3	4	5	27.	Business and industry can donate obsolete equipment that may still be useful in the technology education laboratory situation.
1	2	3	4	5	28.	Business and industry can loan equipment to the technology education program on a short-term basis for the purpose of instruction.
1	2	3	4	5	29.	Business and industry can provide technology educators with a list of materials available for purchase through their local suppliers, so that the technology education program can benefit from the volume purchasing power of a major industry.
1	2	3	4	5	30.	Business and industry personnel wishing to donate new equipment to technology education programs can visit other programs utilizing the equipment in order to see it in use.
1	2	3	4	5	31.	Business and industry can provide supplies, materials, and equipment for use in technology education laboratories.
1	2	3	4	5	32.	Business and industry can assist technology education programs in keeping their equipment modern and up to date.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	33.	Business and industry can donate outdated or worn out equipment to technology education programs to be "cannibalized" for parts.
1	2	3	4	5	34.	Business and industry personnel can provide maintenance or repair of equipment in the technology education laboratory at reduced cost or at no charge to the school.
1	2	3	4	5	35.	Business and industry and the school system can provide for a "pooling" of resources that each has, including technical expertise in different areas.
1	2	3	4	5	36.	Technology education teachers can provide industry with a list of "needs," while business and industry can circulate a list of available materials such as paper products, chemicals, equipment, etc.
1	2	3	4	5	37.	Businesses that are not partners can be contacted by members of the partnership regarding the availability of useable materials by the technology education program.
1	2	3	4	5	38.	Technology educators can visit business sites before purchasing materials to see applications that more closely align new purchases to direct student applications.
1	2	3	4	5	39.	Business and industry can fund additions to the technical library at the school.
1	2	3	4	5	40.	Business and industry can provide computers on a lease basis to schools or donate computers as upgrades are purchased.
1	2	3	4	5	41.	A yearly grant program can be developed through business and industry for purchasing equipment for the technology education program.
1	2	3	4	5	42.	A system of proactive goals for replacing out-of-date equipment can be developed and implemented.
1	2	3	4	5	43.	A specific list of the yearly costs incurred in the technology education laboratory can be provided to sponsoring business and industry representatives.
1	2	3	4	5	44.	University programs can make donations to secondary technology education programs.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	45.	Business and industry can provide funds to match those generated by technology education fund raisers.
1	2	3	4	5	46.	Business and industry can donate high tech parts and materials to be used as teaching aids in the technology education program.
1	2	3	4	5	47.	Business and industry can allow teachers to "shadow" professionals in the workplace.
1	2	3	4	5	48.	Business and industry can have engineers come to the technology education classroom in order to work with students on a problem-solving competition.
1	2	3	4	5	49.	Business and industry can provide opportunities for technology education teachers to attend industry-sponsored conferences and seminars.
1	2	3	4	5	50.	Business and industry could sponsor local Technology Student Association students in local, state, and national competition.
1	2	3	4	5	51.	Business and industry could provide summer or co-op work for students in technology education classes.
1	2	3	4	5	52.	Business and industry can provide "shadowing" opportunities for students interested in specific careers.
1	2	3	4	5	53.	Business and industry can adopt a technology education program, providing some form of financial support for relevant instruction.
1	2	3	4	5	54.	Business and industry can provide opportunities for technology education students to access equipment at their facilities.
1	2	3	4	5	55.	Business and industry can offer technology education instructors seminars and workshops available through their organization.
1	2	3	4	5	56.	Tours of local industries can be made available to technology education teachers so that teachers can talk with personnel to see if their program represents "real technology" and is up to date.
1	2	3	4	5	57.	Business and industry can supply funds to send teachers to staff development workshops.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	58.	Business and industry could sponsor technology education teachers in obtaining a higher degree at colleges and vocational training centers.
1	2	3	4	5	59.	Business and industry can provide resource personnel to serve as guest speakers at instructional in-service meetings.
1	2	3	4	5	60.	Business and industry can provide samples of work, ranging from high quality to poor quality to help students develop an understanding of quality control.
1	2	3	4	5	61.	Business and industry personnel can provide "mini-workshops" for technology education students covering areas such as use of equipment and safety.
1	2	3	4	5	62.	Personnel from business and industry can visit the technology education laboratory in order to demonstrate the usage of particular pieces of equipment.
1	2	3	4	5	63.	Business and industry can provide workshops for teachers designed to train them on the usage of equipment during the summer.
1	2	3	4	5	64.	Business and industry can pay teachers for training during the summer.
1	2	3	4	5	65.	Business and industry can provide periodic training for teachers on software related to equipment used in the technology education lab.
1	2	3	4	5	66.	Business and industry can provide mentors and tutors for teachers and students.
1	2	3	4	5	67.	Technology educators can be exposed to new standard procedures used in business and industry, such as Statistical Process Control (SPC), so that they may develop an understanding of these procedures.
1	2	3	4	5	68.	Business and industry can afford technology educators with opportunities to participate in self-directed teams to observe skills required in the workplace.
1	2	3	4	5	69.	Business and industry can work with the State Department of Education in order to make sure that the teachers are aware of the dynamics of change that are occurring.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	70.	Business and industry and technology education can encourage site-to-site exchanges--teachers into business and business into schools.
1	2	3	4	5	71.	Business and industry personnel can be involved in explaining career paths and explaining technical jobs to technology education students.
1	2	3	4	5	72.	The technology education class can occasionally meet at the actual business sites.
1	2	3	4	5	73.	Business and industry can train educators in the "soft skills" of communication, team work, problem solving, decision making, higher order thinking, technology, etc.
1	2	3	4	5	74.	Technology educators can help business and industry train their employees in upgrading basic skills.
1	2	3	4	5	75.	Business and industry can conduct Total Quality Management (TQM) seminars at business sites.
1	2	3	4	5	76.	Business and industry can participate in the review and assessment of student performance--Did we hit the target? If so, how well? Are these students ready for life/work?
1	2	3	4	5	77.	Technology education programs and business and industry can provide school-to-work experiences for students.
1	2	3	4	5	78.	Businesses can bring technology education teachers into the workplace for a one-day look at what is required to run the business.
1	2	3	4	5	79.	Business and industry can invite and allow technology education teachers, administrators, and students to attend general management meetings and training sessions at the workplace.
1	2	3	4	5	80.	Business and industry personnel can provide models for assessment, drawn from best practice in industry, which may be adaptable for use in secondary technology education programs.
1	2	3	4	5	81.	Businesses and schools can collaborate to develop some joint instructional sessions in industry training areas during off-peak time periods.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	82.	Business and industry can provide seminars for *student teachers* giving them hands-on experience with current trends in the workplace.
1	2	3	4	5	83.	Technology educators and business and industry personnel can explore ways to combine classroom work with industry or business-based activities.
1	2	3	4	5	84.	Business and industry can provide site tours to provide students and the instructional staff with a first-hand look at a modern-day worksite.
1	2	3	4	5	85.	Business and industry can provide resource personnel to serve as guest speakers in the classroom.
1	2	3	4	5	86.	Individuals in business and industry can offer their expertise to the technology education instructor, either outside of or during class time.
1	2	3	4	5	87.	Video materials used in training/safety could be shared with local technology education instructors.
1	2	3	4	5	88.	Business and industry can allow technology education teachers to work with professionals through internships in the workplace in order to receive expert "on-the-job" training.
1	2	3	4	5	89.	Business and industry can get involved with the entire school to involve all staff and students through activities such as assemblies and faculty meetings.
1	2	3	4	5	90.	Personnel from business and industry can come to the classroom to teach certain areas of the curriculum.
1	2	3	4	5	91.	Personnel managers could provide information about resumes, job applications, and interview skills to participants in technology education programs.
1	2	3	4	5	92.	Business and industry can provide part-time employees to supplement and assist present technology education staff.
1	2	3	4	5	93.	Tutoring labs staffed by business employees can be made available to technology education students and instructors on a weekly basis.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	94.	Videos, slides, and presentations can be offered to technology education students concerning how and why technology is the "engine" driving the economic machine.
1	2	3	4	5	95.	Plant tours and discussion groups can be conducted between secondary education guidance counselors, career education personnel, and business and industry training and technical staffs.
1	2	3	4	5	96.	Local American Society for Training and Development (ASTD) chapters can host panel discussions on technology education/curriculum for faculty in local secondary schools.
1	2	3	4	5	97.	Local business and industry can sponsor a local "in-service points" program as mutually accepted by business and industry and the school system.
1	2	3	4	5	98.	Business and industry human resource representatives, along with the local American Society of Personnel Administrators (ASPA) can together create a video concerning speech and presentation skills for use in the technology education classroom or for transmission via satellite to multiple locations.
1	2	3	4	5	99.	Business and industry can present students with facts concerning how and why technology education leads to a "value added" economy and how essential it is to remain competitive in a global economy.
1	2	3	4	5	100.	Business and industry can send printed information to be used by technology education students concerning technologies currently in use at local industries.
1	2	3	4	5	101.	Representatives from local business and industry can make presentations to local, district, or statewide groups of technology teachers.
1	2	3	4	5	102.	Businesses can provide intern opportunities for students to earn school credits, rather than monetary wages.
1	2	3	4	5	103.	Business and industry personnel can teach students study skills and time-management skills from grades 4-8.
1	2	3	4	5	104.	Business and industry personnel can actually attend training sessions with or for curriculum staff.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	105.	Business and industry can train technology education teachers so that they may train other teachers.
1	2	3	4	5	106.	Business and industry can include technology education students in all processes of educating teachers and administrators in the area of technology.
1	2	3	4	5	107.	Business and industry can provide technology educators with a brief outline of activities or areas that can be covered in a given module.
1	2	3	4	5	108.	Technology education students can be required to interview their parents or friends about qualifications in various occupations in order to identify material that may be incorporated in the technology education curriculum.
1	2	3	4	5	109.	Vendors or suppliers can hold workshops for technology education teachers and business and industry personnel.
1	2	3	4	5	110.	Technology education students can be offered extra credit for having their parents address the class concerning the nature of their work and their real-life experiences leading up to their choice of a career.
1	2	3	4	5	111.	Technology education students can work in small groups to brainstorm relevant questions and call various business and industry personnel regarding the qualifications of specific jobs.
1	2	3	4	5	112.	Technology students can "network" with various business and industry personnel through Internet or other educational computer networks.
1	2	3	4	5	113.	Teachers from business courses and career orientation courses can team teach with an emphasis on team activities and community resource speakers.
1	2	3	4	5	114.	Business personnel can provide technology education students with a list of educational and special training requirements for their respective fields.
1	2	3	4	5	115.	Business and industry can provide technology education programs with technical documentation and journals that are actually used in their industry.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

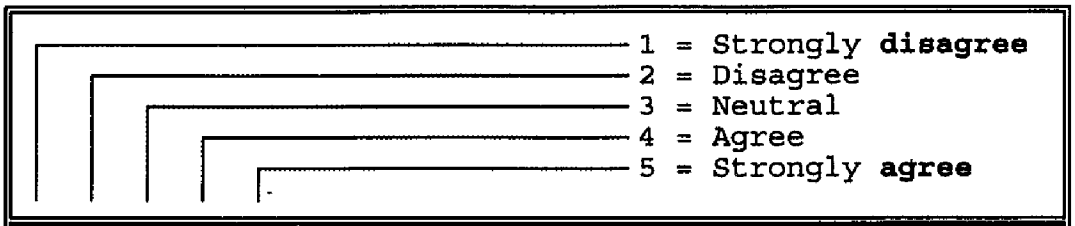
1	2	3	4	5	116.	Business and industry personnel can serve on local school boards.
1	2	3	4	5	117.	Business and industry can sponsor "science fair" type activities for technology education students.
1	2	3	4	5	118.	Business and industry can adopt schools and reward them with donations for good performance.
1	2	3	4	5	119.	Cross-visitation programs can be set up between secondary and post-secondary schools that include guidelines and structured activities.
1	2	3	4	5	120.	Business and industry could adopt technology education programs and provide exposure in commercial and industrial publications.
1	2	3	4	5	121.	Business and industry can critique technology education laboratory situations/conditions and offer suggestions for improvement.
1	2	3	4	5	122.	Business and industry can offer labor or expertise in specific areas to set up or improve technology education laboratory facilities.
1	2	3	4	5	123.	Business personnel can serve on technology education advisory committees.
1	2	3	4	5	124.	Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.
1	2	3	4	5	125.	Business and industry can provide plaques, trophies, etc., for outstanding technology education students.
1	2	3	4	5	126.	Business and industry can provide an awards banquet for outstanding technology education students.
1	2	3	4	5	127.	Schools can "compare notes" on what they are receiving from business partners.
1	2	3	4	5	128.	Business and industry and technology education programs can work together to publicize successful programs in order to make the public aware of the program.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	129.	Business units can develop funds to support the partnership program so that funding is not a responsibility of the public school system.
1	2	3	4	5	130.	Business and industry can participate in local "Adopt A School" programs.
1	2	3	4	5	131.	Technology educators can guarantee that students can perform on the job. If not, educators retrain, not business.
1	2	3	4	5	132.	Technology education and business and industry can work jointly to set policy.
1	2	3	4	5	133.	Business and industry can support high school clubs that have economic or business relationships with the workplace.
1	2	3	4	5	134.	Business and industry representatives and technology educators can work together toward developing a mutual goal that is beneficial to both business and industry and the technology education program.
1	2	3	4	5	135.	Business and industry can provide opportunities for technology education students to be involved in community projects.
1	2	3	4	5	136.	Technology educators can work with students to explore meaningful ways for students to express appreciation for the help generously given by business and industry to the program.
1	2	3	4	5	137.	Lines of communication can be opened between proven "movers and shakers" from business and industry and technology education who have authority to make changes.
1	2	3	4	5	138.	Technology education students can produce employee incentive/recognition products, such as clocks or other items for businesses.
1	2	3	4	5	139.	Business and industry personnel and technology educators can serve on ad hoc committees.
1	2	3	4	5	140.	Business and education committees can pay visits to vocational-technical school sites.

1 = Strongly **disagree**
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly **agree**

1	2	3	4	5	141.	A combined committee of technology education and business and industry representatives can form a partnership committee in order to provide ongoing reports.
1	2	3	4	5	142.	Business and industry can actively encourage schools to get involved with the Technology Student Association (TSA) or other vocational student organizations.
1	2	3	4	5	143.	Business and industry can provide technology education programs with up-to-date publications, journals, and videos such as "Beyond 2000" and "Invention".
1	2	3	4	5	144.	Technology education programs can publicize contributions made by business and industry through local news media.
1	2	3	4	5	145.	Business and industry personnel can assist technology educators in writing grants for external funding.
1	2	3	4	5	146.	Individual business and industry personnel can work with other school districts to research methods already being used successfully.
1	2	3	4	5	147.	Business and industry can sponsor and support Tech Prep programs that "tie" the secondary programs to the post-secondary programs.
1	2	3	4	5	148.	Technology education committees can pay visits to business and industry worksites.
1	2	3	4	5	149.	Technology educators can get on the mailing list of the American Society for Training and Development (ASTD).
1	2	3	4	5	150.	Business and industry and technology education programs can involve business associations, such as the American Society of Mechanical Engineers and the American Electrical Association in activities, when possible.
1	2	3	4	5	151.	A specific list of requirements and up-to-date information regarding instructional staff can be provided to sponsoring business and industry representatives.



1	2	3	4	5	152.	Business and industry can work with technology education programs to identify and agree on outcomes and content standards, along with appropriate bench marks.
1	2	3	4	5	153.	A system for implementing change can be developed and instituted.

Please list any additional activities that you feel are appropriate parts of a partnership between secondary technology education programs and business and industry that were not included on this questionnaire.

Thanks again for your timely response to this questionnaire.

APPENDIX R

ROUND TWO FOLLOWUP POSTCARD

<DATE>

Greetings,

Several days ago you should have received the second questionnaire for our study identifying activities that are appropriate parts of a partnership between secondary technology education programs and business and industry. If you did not receive the questionnaire or if you have questions about the study, please give me a call at (912) 333-5928. I am looking forward to receiving your response.

APPENDIX S

ROUND THREE LETTER OF EXPLANATION

Date

1~
2~

Dear 3~

Enclosed is the final questionnaire in our study concerning activities that are appropriate parts of a partnership between secondary technology education programs and business and industry. I expect that you will find that the amount of time necessary to complete this questionnaire will be much less than the amount required to complete the previous version. Although each panelist was given the opportunity to add additional activities to the previous round, no specific additional activities were given. This questionnaire also allows you to add activities that were not previously given.

Please keep in mind that purpose of this study is to identify activities that are appropriate for secondary technology education/business and industry partnerships and to reach a consensus on the appropriateness of the activities. Therefore, this questionnaire gives you the opportunity to either retain your previous rating of each item or to revise your rating which may move it closer to the panel's mean rating. I urge you to consider the panel's mean rating when making your decision, but do not feel pressured to change your rating if you do not wish to do so. You were selected for inclusion on this panel due to your expertise in the area of partnerships and your knowledge and opinions are important. Specific directions for making revisions are given on the questionnaire. Please return the completed questionnaire in the enclosed stamped, self addressed envelope or fax it to me at (912) 333-7167 by September 20, 1994. Please call me at (912) 333-5928 if you have any questions about the study.

Once again I would like to thank you for your participation on this panel. Upon completion of the study, I will send you a copy of the list of activities and their final ratings.

Sincerely

Charles E. Backes
Assistant Professor
Vocational Education

APPENDIX T

ROUND THREE QUESTIONNAIRE

Identification of Activities That Are Appropriate Parts of a Partnership Between Secondary Technology Education Programs and Business and Industry

Directions:

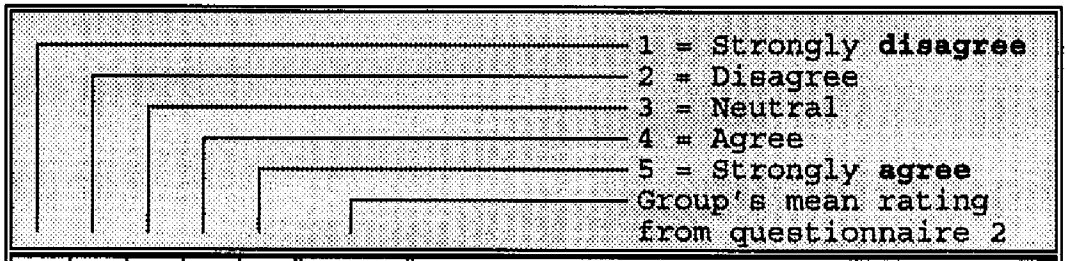
On this final questionnaire, you are requested to reconsider each of the items previously identified. Note that the group's mean rating from questionnaire 2 is given in the column next to the item number. In addition, please note that your previous rating is circled in red. If your previous response differed from the group's mean rating by more than two points, the item has been highlighted in yellow. Please reconsider and rate each item using the following procedure:

For items not highlighted, if you do not wish to change your rating, no action is necessary;

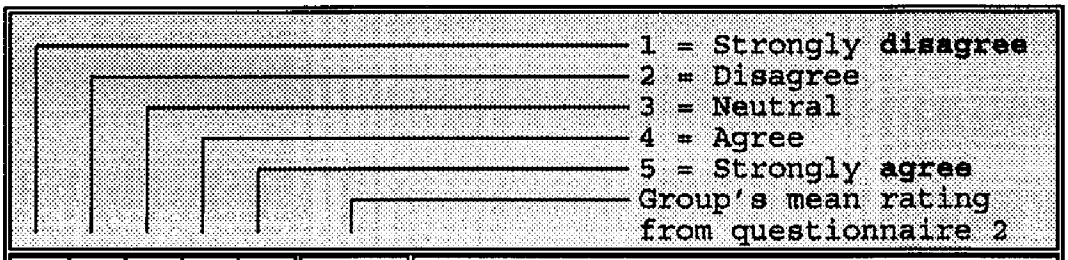
For items not highlighted, if you wish to change your rating, circle the appropriate numeral that corresponds with your revised rating;

For highlighted items, if you wish to revise your rating in order to move it closer to the mean rating, circle the appropriate numeral that corresponds with your revised rating;

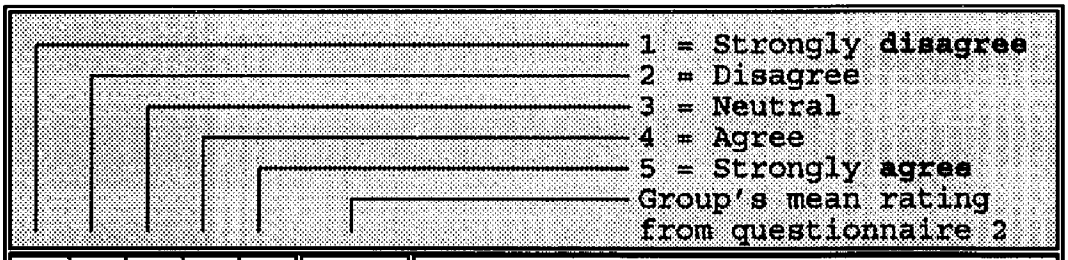
For highlighted items, if you do not wish to revise your rating, please state briefly why you feel that your rating is appropriate in the margin next to the activity.



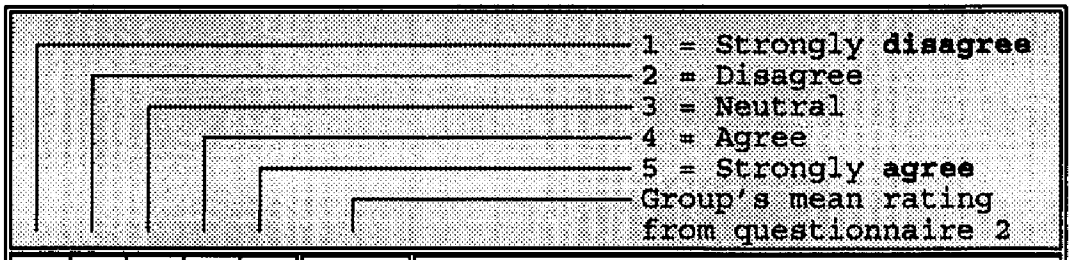
1	2	3	4	5	4.50	1.	Business and industry can be allowed and encouraged to provide input into the development of curriculum.
1	2	3	4	5	4.41	2.	Business and industry can provide general and specific training materials to be included in the curriculum.



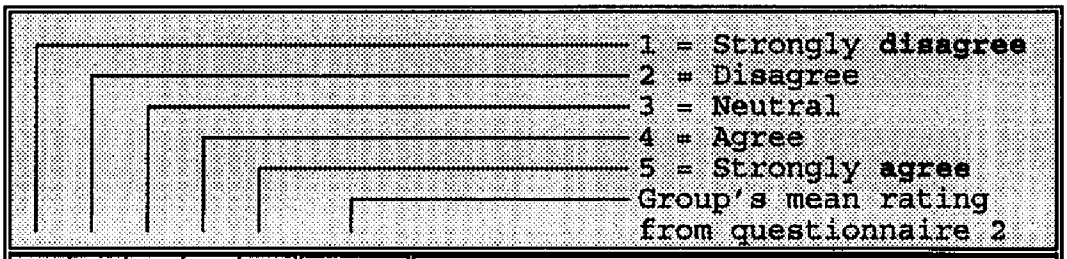
1	2	3	4	5	4.53	3.	Business and industry can provide input into general and specific behavioral objectives for their future employees.
1	2	3	4	5	4.59	4.	Business and industry can serve on advisory committees to help choose instructional materials as used in business.
1	2	3	4	5	4.35	5.	Business and industry personnel can tour school facilities in order to offer suggestions on curriculum changes.
1	2	3	4	5	4.76	6.	Business and industry can provide technology educators with information on the latest developments in supplies, materials, and equipment.
1	2	3	4	5	4.47	7.	Business and industry can make suggestions regarding supplies, materials, and equipment used in the technology education program.
1	2	3	4	5	4.03	8.	Business and industry can create curricula for the equipment used in the classroom with the input of the classroom teachers.
1	2	3	4	5	4.65	9.	Business and industry and technology education programs can develop standards to ensure that partnerships are working and don't exist in name only.
1	2	3	4	5	4.29	10.	Business and industry personnel can review texts and suggest methods of applications of theory to the real world/work.
1	2	3	4	5	4.24	11.	Business and industry can participate on school board curriculum committees.
1	2	3	4	5	4.41	12.	Business and industry representatives can make presentations to schools, community school boards, educators, etc., on the value, need, and benefits of changing curricula and teaching methods.
1	2	3	4	5	4.12	13.	Technology education programs can consider the recommendations of the SCANS report when setting curriculum standards.



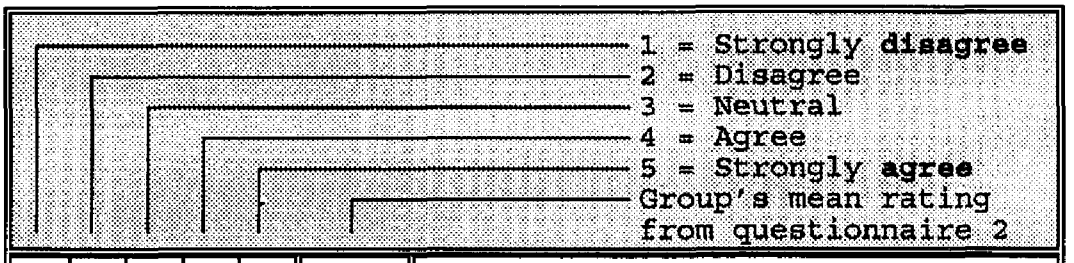
1	2	3	4	5	4.12	14.	Business and industry can provide industry-developed curricula for use in developing or modifying portions of the secondary technology education curriculum.
1	2	3	4	5	4.71	15.	Business and industry and technology education representatives can engage in ongoing dialogue to clarify business and industry needs and requirements.
1	2	3	4	5	4.47	16.	Business and industry personnel and technology educators can collaborate on the design of career awareness materials or training which can be used in secondary technology education programs and in continuing education/employee development initiatives in local businesses.
1	2	3	4	5	4.50	17.	Students can participate in internships with business and industry to discover the relevance of the secondary technology education curriculum.
1	2	3	4	5	4.35	18.	Discussions and "show and tell" sessions can be conducted involving teachers of math, science, computer education, and technology education along with training and development personnel from business and industry to learn of remediation efforts and curriculum redevelopment efforts.
1	2	3	4	5	4.06	19.	Businesses can review curricula at all levels, beginning with local elementary schools.
1	2	3	4	5	4.29	20.	Business and industry personnel can serve on state curriculum committees.
1	2	3	4	5	4.24	21.	Technology education programs can get help through the local Chamber of Commerce in order to identify industries that may volunteer to review curricula.



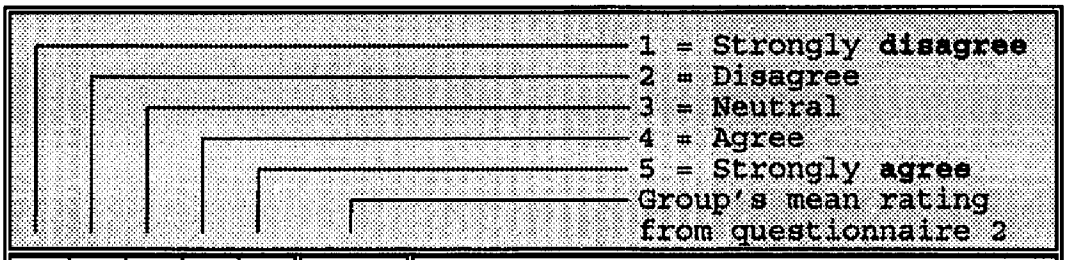
1	2	3	4	5	4.38	22.	Joint meetings can be held that include secondary, post-secondary, and business personnel to discuss course content, revisions, etc in order to keep curricula current.
1	2	3	4	5	4.29	23.	Business personnel can provide insight to common problems in their business to create curricula that will help develop problem-solving skills.
1	2	3	4	5	3.97	24.	Business and industry personnel can attend seminars and address how to teach SCANS skills as well as other skills that are needed for entry-level employment.
1	2	3	4	5	3.79	25.	State Department of Education personnel can be utilized to locate industries willing to make donations to secondary technology education programs.
1	2	3	4	5	4.44	26.	Local industry can bring equipment to the technology education laboratory and demonstrate its uses.
1	2	3	4	5	4.03	27.	Business and industry can donate obsolete equipment that may still be useful in the technology education laboratory situation.
1	2	3	4	5	4.12	28.	Business and industry can loan equipment to the technology education program on a short-term basis for the purpose of instruction.
1	2	3	4	5	4.41	29.	Business and industry can provide technology educators with a list of materials available for purchase through their local suppliers, so that the technology education program can benefit from the volume purchasing power of a major industry.
1	2	3	4	5	4.41	30.	Business and industry personnel wishing to donate new equipment to technology education programs can visit other programs utilizing the equipment in order to see it in use.



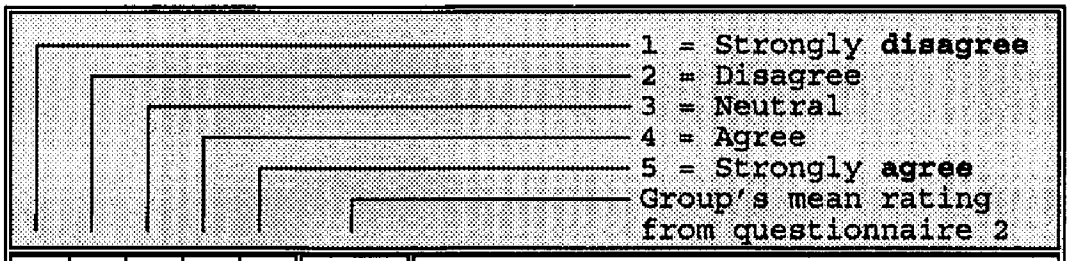
1	2	3	4	5	4.56	31.	Business and industry can provide supplies, materials, and equipment for use in technology education laboratories.
1	2	3	4	5	4.65	32.	Business and industry can assist technology education programs in keeping their equipment modern and up to date.
1	2	3	4	5	3.91	33.	Business and industry can donate outdated or worn out equipment to technology education programs to be "cannibalized" for parts.
1	2	3	4	5	4.00	34.	Business and industry personnel can provide maintenance or repair of equipment in the technology education laboratory at reduced cost or at no charge to the school.
1	2	3	4	5	4.32	35.	Business and industry and the school system can provide for a "pooling" of resources that each has, including technical expertise in different areas.
1	2	3	4	5	4.38	36.	Technology education teachers can provide industry with a list of "needs," while business and industry can circulate a list of available materials such as paper products, chemicals, equipment, etc.
1	2	3	4	5	4.09	37.	Businesses that are not partners can be contacted by members of the partnership regarding the availability of useable materials by the technology education program.
1	2	3	4	5	4.32	38.	Technology educators can visit business sites before purchasing materials to see applications that more closely align new purchases to direct student applications.
1	2	3	4	5	4.09	39.	Business and industry can fund additions to the technical library at the school.
1	2	3	4	5	3.97	40.	Business and industry can provide computers on a lease basis to schools or donate computers as upgrades are purchased.



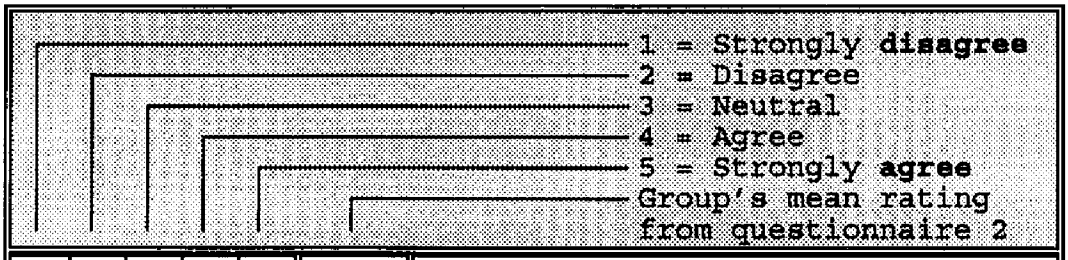
1	2	3	4	5	4.29	41.	A yearly grant program can be developed through business and industry for purchasing equipment for the technology education program.
1	2	3	4	5	4.21	42.	A system of proactive goals for replacing out-of-date equipment can be developed and implemented.
1	2	3	4	5	3.94	43.	A specific list of the yearly costs incurred in the technology education laboratory can be provided to sponsoring business and industry representatives.
1	2	3	4	5	4.06	44.	University programs can make donations to secondary technology education programs.
1	2	3	4	5	3.88	45.	Business and industry can provide funds to match those generated by technology education fund raisers.
1	2	3	4	5	4.26	46.	Business and industry can donate high tech parts and materials to be used as teaching aids in the technology education program.
1	2	3	4	5	4.41	47.	Business and industry can allow teachers to "shadow" professionals in the workplace.
1	2	3	4	5	4.47	48.	Business and industry can have engineers come to the technology education classroom in order to work with students on a problem-solving competition.
1	2	3	4	5	4.50	49.	Business and industry can provide opportunities for technology education teachers to attend industry-sponsored conferences and seminars.
1	2	3	4	5	4.38	50.	Business and industry could sponsor local Technology Student Association students in local, state, and national competition.
1	2	3	4	5	4.56	51.	Business and industry could provide summer or co-op work for students in technology education classes.



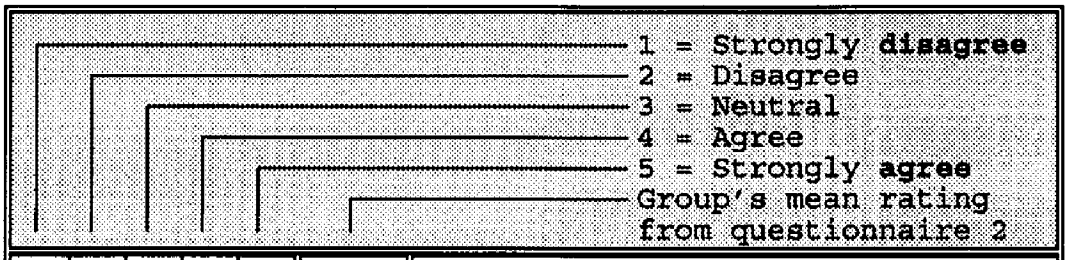
1	2	3	4	5	4.53	52.	Business and industry can provide "shadowing" opportunities for students interested in specific careers.
1	2	3	4	5	4.21	53.	Business and industry can adopt a technology education program, providing some form of financial support for relevant instruction.
1	2	3	4	5	4.18	54.	Business and industry can provide opportunities for technology education students to access equipment at their facilities.
1	2	3	4	5	4.26	55.	Business and industry can offer technology education instructors seminars and workshops available through their organization.
1	2	3	4	5	4.56	56.	Tours of local industries can be made available to technology education teachers so that teachers can talk with personnel to see if their program represents "real technology" and is up to date.
1	2	3	4	5	3.76	57.	Business and industry can supply funds to send teachers to staff development workshops.
1	2	3	4	5	3.79	58.	Business and industry could sponsor technology education teachers in obtaining a higher degree at colleges and vocational training centers.
1	2	3	4	5	4.62	59.	Business and industry can provide resource personnel to serve as guest speakers at instructional in-service meetings.
1	2	3	4	5	4.47	60.	Business and industry can provide samples of work, ranging from high quality to poor quality to help students develop an understanding of quality control.
1	2	3	4	5	4.38	61.	Business and industry personnel can provide "mini-workshops" for technology education students covering areas such as use of equipment and safety.



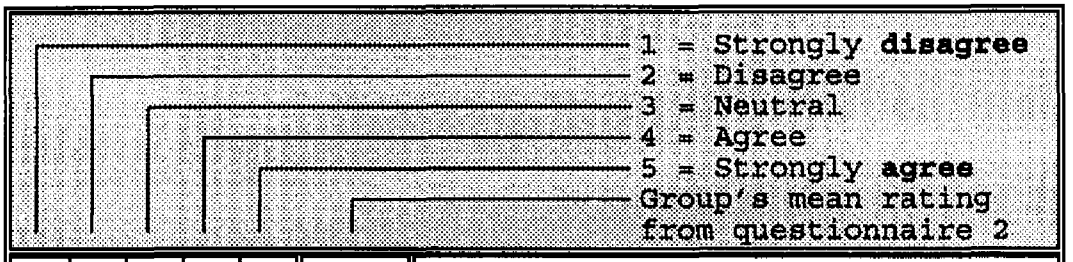
1	2	3	4	5	4.41	62.	Personnel from business and industry can visit the technology education laboratory in order to demonstrate the usage of particular pieces of equipment.
1	2	3	4	5	4.26	63.	Business and industry can provide workshops for teachers designed to train them on the usage of equipment during the summer.
1	2	3	4	5	3.47	64.	Business and industry can pay teachers for training during the summer.
1	2	3	4	5	4.15	65.	Business and industry can provide periodic training for teachers on software related to equipment used in the technology education lab.
1	2	3	4	5	4.44	66.	Business and industry can provide mentors and tutors for teachers and students.
1	2	3	4	5	4.38	67.	Technology educators can be exposed to new standard procedures used in business and industry, such as Statistical Process Control (SPC), so that they may develop an understanding of these procedures.
1	2	3	4	5	4.12	68.	Business and industry can afford technology educators with opportunities to participate in self-directed teams to observe skills required in the workplace.
1	2	3	4	5	4.00	69.	Business and industry can work with the State Department of Education in order to make sure that the teachers are aware of the dynamics of change that are occurring.
1	2	3	4	5	4.38	70.	Business and industry and technology education can encourage site-to-site exchanges--teachers into business and business into schools.
1	2	3	4	5	4.53	71.	Business and industry personnel can be involved in explaining career paths and explaining technical jobs to technology education students.



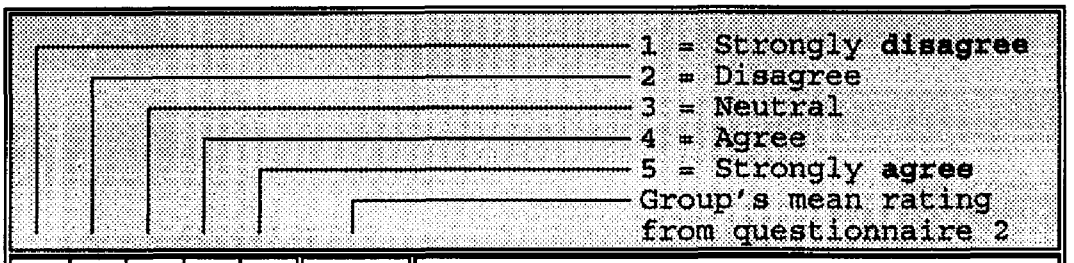
1	2	3	4	5	4.21	72.	The technology education class can occasionally meet at the actual business sites.
1	2	3	4	5	4.26	73.	Business and industry can train educators in the "soft skills" of communication, team work, problem solving, decision making, higher order thinking, technology, etc.
1	2	3	4	5	4.21	74.	Technology educators can help business and industry train their employees in upgrading basic skills.
1	2	3	4	5	4.12	75.	Business and industry can conduct Total Quality Management (TQM) seminars at business sites.
1	2	3	4	5	3.91	76.	Business and industry can participate in the review and assessment of student performance--Did we hit the target? If so, how well? Are these students ready for life/work?
1	2	3	4	5	4.50	77.	Technology education programs and business and industry can provide school-to-work experiences for students.
1	2	3	4	5	4.47	78.	Businesses can bring technology education teachers into the workplace for a one-day look at what is required to run the business.
1	2	3	4	5	4.06	79.	Business and industry can invite and allow technology education teachers, administrators, and students to attend general management meetings and training sessions at the workplace.
1	2	3	4	5	4.03	80.	Business and industry personnel can provide models for assessment, drawn from best practice in industry, which may be adaptable for use in secondary technology education programs.
1	2	3	4	5	4.09	81.	Businesses and schools can collaborate to develop some joint instructional sessions in industry training areas during off-peak time periods.



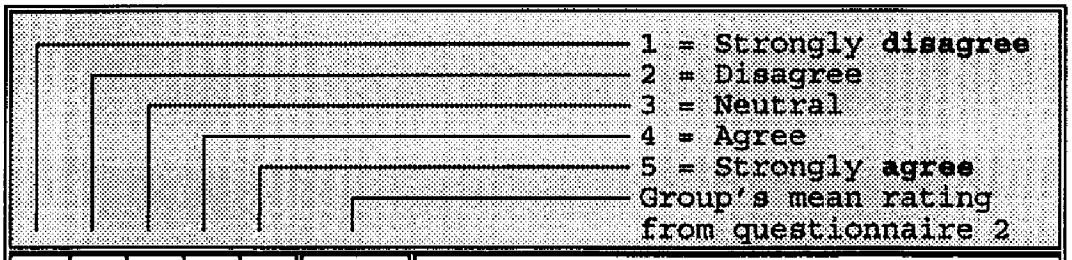
1	2	3	4	5	4.24	82.	Business and industry can provide seminars for *student teachers* giving them hands-on experience with current trends in the workplace.
1	2	3	4	5	4.30	83.	Technology educators and business and industry personnel can explore ways to combine classroom work with industry or business-based activities.
1	2	3	4	5	4.65	84.	Business and industry can provide site tours to provide students and the instructional staff with a first-hand look at a modern-day worksite.
1	2	3	4	5	4.68	85.	Business and industry can provide resource personnel to serve as guest speakers in the classroom.
1	2	3	4	5	4.55	86.	Individuals in business and industry can offer their expertise to the technology education instructor, either outside of or during class time.
1	2	3	4	5	4.47	87.	Video materials used in training/safety could be shared with local technology education instructors.
1	2	3	4	5	4.21	88.	Business and industry can allow technology education teachers to work with professionals through internships in the workplace in order to receive expert "on-the-job" training.
1	2	3	4	5	3.91	89.	Business and industry can get involved with the entire school to involve all staff and students through activities such as assemblies and faculty meetings.
1	2	3	4	5	4.09	90.	Personnel from business and industry can come to the classroom to teach certain areas of the curriculum.
1	2	3	4	5	4.59	91.	Personnel managers could provide information about resumes, job applications, and interview skills to participants in technology education programs.



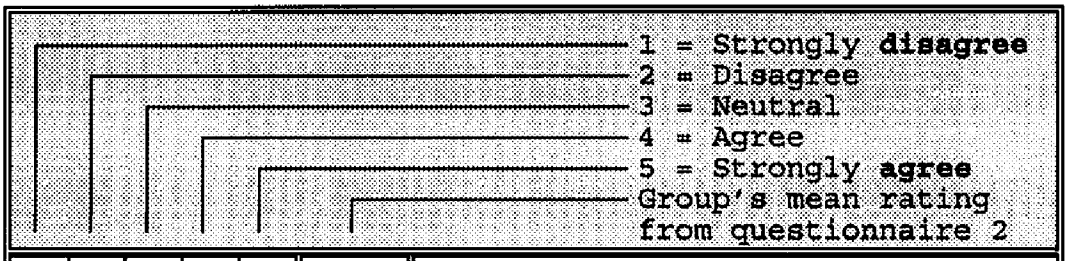
1	2	3	4	5	3.50	92.	Business and industry can provide part-time employees to supplement and assist present technology education staff.
1	2	3	4	5	3.70	93.	Tutoring labs staffed by business employees can be made available to technology education students and instructors on a weekly basis.
1	2	3	4	5	4.18	94.	Videos, slides, and presentations can be offered to technology education students concerning how and why technology is the "engine" driving the economic machine.
1	2	3	4	5	4.38	95.	Plant tours and discussion groups can be conducted between secondary education guidance counselors, career education personnel, and business and industry training and technical staffs.
1	2	3	4	5	3.85	96.	Local American Society for Training and Development (ASTD) chapters can host panel discussions on technology education/curriculum for faculty in local secondary schools.
1	2	3	4	5	3.74	97.	Local business and industry can sponsor a local "in-service points" program as mutually accepted by business and industry and the school system.
1	2	3	4	5	3.68	98.	Business and industry human resource representatives, along with the local American Society of Personnel Administrators (ASPA) can together create a video concerning speech and presentation skills for use in the technology education classroom or for transmission via satellite to multiple locations.
1	2	3	4	5	4.16	99.	Business and industry can present students with facts concerning how and why technology education leads to a "value added" economy and how essential it is to remain competitive in a global economy.



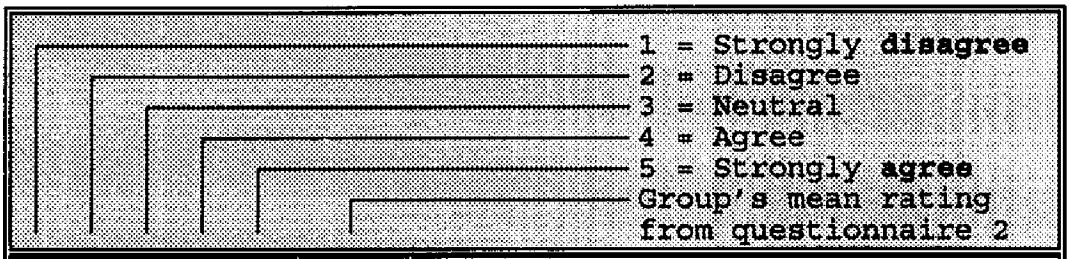
1	2	3	4	5	4.12	100.	Business and industry can send printed information to be used by technology education students concerning technologies currently in use at local industries.
1	2	3	4	5	4.35	101.	Representatives from local business and industry can make presentations to local, district, or statewide groups of technology teachers.
1	2	3	4	5	3.85	102.	Businesses can provide intern opportunities for students to earn school credits, rather than monetary wages.
1	2	3	4	5	3.62	103.	Business and industry personnel can teach students study skills and time-management skills from grades 4-8.
1	2	3	4	5	4.88	104.	Business and industry personnel can actually attend training sessions with or for curriculum staff.
1	2	3	4	5	3.82	105.	Business and industry can train technology education teachers so that they may train other teachers.
1	2	3	4	5	3.50	106.	Business and industry can include technology education students in all processes of educating teachers and administrators in the area of technology.
1	2	3	4	5	3.94	107.	Business and industry can provide technology educators with a brief outline of activities or areas that can be covered in a given module.
1	2	3	4	5	3.76	108.	Technology education students can be required to interview their parents or friends about qualifications in various occupations in order to identify material that may be incorporated in the technology education curriculum.
1	2	3	4	5	4.06	109.	Vendors or suppliers can hold workshops for technology education teachers and business and industry personnel.



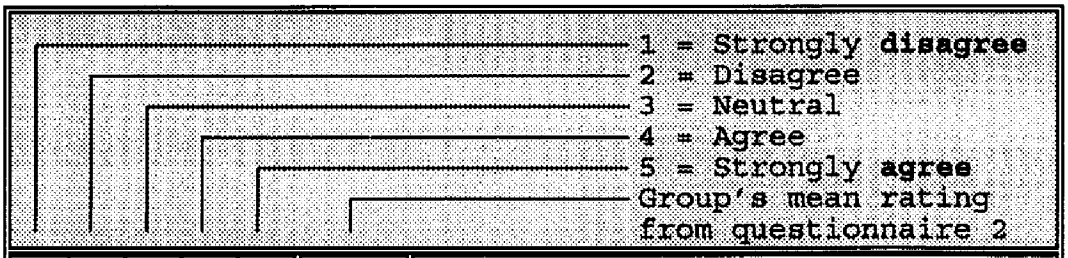
1	2	3	4	5	3.71	110.	Technology education students can be offered extra credit for having their parents address the class concerning the nature of their work and their real-life experiences leading up to their choice of a career.
1	2	3	4	5	4.24	111.	Technology education students can work in small groups to brainstorm relevant questions and call various business and industry personnel regarding the qualifications of specific jobs.
1	2	3	4	5	4.16	112.	Technology students can "network" with various business and industry personnel through Internet or other educational computer networks.
1	2	3	4	5	4.29	113.	Teachers from business courses and career orientation courses can team teach with an emphasis on team activities and community resource speakers.
1	2	3	4	5	4.33	114.	Business personnel can provide technology education students with a list of educational and special training requirements for their respective fields.
1	2	3	4	5	4.18	115.	Business and industry can provide technology education programs with technical documentation and journals that are actually used in their industry.
1	2	3	4	5	4.29	116.	Business and industry personnel can serve on local school boards.
1	2	3	4	5	4.32	117.	Business and industry can sponsor "science fair" type activities for technology education students.
1	2	3	4	5	4.18	118.	Business and industry can adopt schools and reward them with donations for good performance.



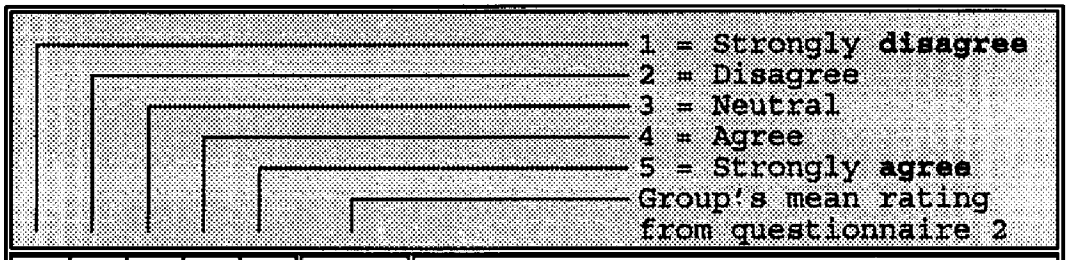
1	2	3	4	5	4.18	119.	Cross-visitation programs can be set up between secondary and post-secondary schools that include guidelines and structured activities.
1	2	3	4	5	4.12	120.	Business and industry could adopt technology education programs and provide exposure in commercial and industrial publications.
1	2	3	4	5	4.15	121.	Business and industry can critique technology education laboratory situations/conditions and offer suggestions for improvement.
1	2	3	4	5	4.12	122.	Business and industry can offer labor or expertise in specific areas to set up or improve technology education laboratory facilities.
1	2	3	4	5	4.56	123.	Business personnel can serve on technology education advisory committees.
1	2	3	4	5	4.38	124.	Business and industry can provide scholarships for technology education students who wish to pursue a related post-secondary education.
1	2	3	4	5	4.42	125.	Business and industry can provide plaques, trophies, etc., for outstanding technology education students.
1	2	3	4	5	4.38	126.	Business and industry can provide an awards banquet for outstanding technology education students.
1	2	3	4	5	4.03	127.	Schools can "compare notes" on what they are receiving from business partners.
1	2	3	4	5	4.50	128.	Business and industry and technology education programs can work together to publicize successful programs in order to make the public aware of the program.
1	2	3	4	5	3.76	129.	Business units can develop funds to support the partnership program so that funding is not a responsibility of the public school system.



1	2	3	4	5	4.62	130.	Business and industry can participate in local "Adopt A School" programs.
1	2	3	4	5	3.61	131.	Technology educators can guarantee that students can perform on the job. If not, educators retrain, not business.
1	2	3	4	5	3.79	132.	Technology education and business and industry can work jointly to set policy.
1	2	3	4	5	4.03	133.	Business and industry can support high school clubs that have economic or business relationships with the workplace.
1	2	3	4	5	4.42	134.	Business and industry representatives and technology educators can work together toward developing a mutual goal that is beneficial to both business and industry and the technology education program.
1	2	3	4	5	4.24	135.	Business and industry can provide opportunities for technology education students to be involved in community projects.
1	2	3	4	5	4.24	136.	Technology educators can work with students to explore meaningful ways for students to express appreciation for the help generously given by business and industry to the program.
1	2	3	4	5	4.35	137.	Lines of communication can be opened between proven "movers and shakers" from business and industry and technology education who have authority to make changes.
1	2	3	4	5	3.59	138.	Technology education students can produce employee incentive/recognition products, such as clocks or other items for businesses.
1	2	3	4	5	3.97	139.	Business and industry personnel and technology educators can serve on ad hoc committees.



1	2	3	4	5	4.35	140.	Business and education committees can pay visits to vocational-technical school sites.
1	2	3	4	5	4.06	141.	A combined committee of technology education and business and industry representatives can form a partnership committee in order to provide ongoing reports.
1	2	3	4	5	4.15	142.	Business and industry can actively encourage schools to get involved with the Technology Student Association (TSA) or other vocational student organizations.
1	2	3	4	5	4.32	143.	Business and industry can provide technology education programs with up-to-date publications, journals, and videos such as "Beyond 2000" and "Invention".
1	2	3	4	5	4.29	144.	Technology education programs can publicize contributions made by business and industry through local news media.
1	2	3	4	5	4.15	145.	Business and industry personnel can assist technology educators in writing grants for external funding.
1	2	3	4	5	4.30	146.	Individual business and industry personnel can work with other school districts to research methods already being used successfully.
1	2	3	4	5	4.47	147.	Business and industry can sponsor and support Tech Prep programs that "tie" the secondary programs to the post-secondary programs.
1	2	3	4	5	4.38	148.	Technology education committees can pay visits to business and industry worksites.
1	2	3	4	5	4.09	149.	Technology educators can get on the mailing list of the American Society for Training and Development (ASTD).



1	2	3	4	5	4.18	150.	Business and industry and technology education programs can involve business associations, such as the American Society of Mechanical Engineers and the American Electrical Association in activities, when possible.
1	2	3	4	5	4.06	151.	A specific list of requirements and up-to-date information regarding instructional staff can be provided to sponsoring business and industry representatives.
1	2	3	4	5	4.00	152.	Business and industry can work with technology education programs to identify and agree on outcomes and content standards, along with appropriate bench marks.
1	2	3	4	5	4.30	153.	A system for implementing change can be developed and instituted.

Please list any additional activities that you feel are appropriate parts of a partnership between secondary technology education programs and business and industry that were not included on this questionnaire. Feel free to attach additional comments to the questionnaire.

Thanks again for your timely response to this questionnaire.

APPENDIX U

ROUND THREE FOLLOWUP POSTCARD

Date

Greetings,

Several days ago you should have received the third questionnaire for our study identifying activities that are appropriate parts of a partnership between secondary technology education programs and business and industry. If you did not receive the questionnaire or if you have questions about the study, please give me a call at (912) 333-5928. I am looking forward to receiving your response.

VITA

Charles E. Backes is a member of the Vocational Education faculty at Valdosta State University in Valdosta, Georgia. He and his wife, Lora, live in Valdosta with their three daughters, Michelle, Katherine, and Emily.

Prior to moving to Valdosta, Charles taught industrial arts/technology education at East Ascension High School in Gonzales, Louisiana, for 12 years. He was an active member and officer in the Louisiana Technology Education Association and sponsored chapters affiliated with the American Industrial Arts Student Association and Technology Student Association.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Charles Edward Backes

Major Field: Vocational Education

Title of Dissertation: Identification of Activities That Are Appropriate Parts of a Partnership between Secondary Technology Education Programs and Business and Industry

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

January 24, 1995